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Give Buyers What They Want.

THE same old story of failure of American manufacturers to make the impression upon foreign markets which the merit of their products would warrant is told by the United States Consuls in the various ports of Germany, in the series of special reports on the rubber-goods trade from which many facts of interest are compiled in this issue of THE INDIA RUBBER WORLD.

It is the neglect to study the tastes and wants of the people in other countries.

Now when a dealer from a lumbering district applies to one of our manufacturers for the peculiar style of boots worn by the laboring classes to whom they cater the order is filled without question. But if the demand comes from Fifth avenue, in New York, for light and tasteful rubbers for wear on the city streets, no attempt is made supply lumbermen's boots instead. The wonderful success of the American rubber-shoe manufacturer in the home market has been due to his quickness to perceive every variety of demand that exists in different localities, and the skill with which he has met that demand to the satisfaction of every class of buyers.

Why not apply the same rule to the north of Germany, and to the south of France?

If there should be found a benighted foreigner who would be satisfied with nothing less than a boot containing fourteen pounds of pure rubber, with steel bands to keep the mass from stretching out of shape, let him have that style of boot so long as his money is forthcoming. It is not the business of our manufacturers to correct the tastes and revolutionize the fashions of countries whose civilization was well advanced when New England was still a howling wilderness.

Of course none of our manufacturers are obliged to look abroad for trade; the home demand grows apace with the capacity of their mills. But we submit that it certainly is not good business management, to say the least, to send goods abroad that are not wanted, and agents to try to force the sale of the undesirable articles. It is much as if the worthy denizens of some Dutch town should come over here to sell their wooden shoes to our tennis-players.

The New Rubber Combination.

THE details of completing the organization of the United States Rubber Co. seem to have proceeded slowly during the past month, which is natural, considering the character of the business involved. In the case of each company to be absorbed, not only is an inventory necessary in order to arrive at the value of its property, but legal preliminaries must be observed before one incorporation can be terminated and its affairs placed in the hands of another.

As showing who have been taking an active interest in the affairs of the new company, it may be stated that a recent meeting of directors was attended by Henry L. Hotchkiss, J. Edward Simmons, Robert D. Evans, William L. Trenholm, M. C. Martin, John D. Townsend, John I.

Waterbury, Henry Steers, Charles L. Johnson, William Barbour, Charles E. Thayer, Thomas F. Patterson, and James Deshler. It is stated that George A. Lewis, president of the Goodyear Metallic Rubber-Shoe Co., has been made a director. It has also been given out by the management that stock has been issued so far to the extent of \$12,500,000, but further details are withheld.

It is understood that the officers elected last month are only temporary, the intention being to place rubber-men in actual charge in the near future. It was thought best, however, to have influential Wall-street names at the outset, on the idea that rubber companies asked to sell their plants would more readily enter into negotiations with capitalists outside the trade than with their former competitors. It was considered necessary, also, to secure the assistance of outside capital in order to admit of large cash transactions should such be found desirable.

The Central Rubber Co. Sued.

AN application was filed in the Court of Chancery at Trenton, N. J., on April 14, for an injunction restraining the Central Rubber Co., or any stockholder thereof, from disposing of any of the stock of the company, and asking for an accounting and the appointment of a receiver. The complainants are Albert R. Thomas and Mahlon Hutchinson, stockholders holding 28 and 123 shares, respectively. The defendants are Joseph Whitehead, Frank A. Magowan, Richard R. Whitehead, W. P. Hayes, W. T. Vanness, W. H. Sayen and the Central Rubber Co. The suit grows out of the alleged distribution of the assets of the company among favored stockholders and is brought on behalf of the stockholders said to have been excluded from a share in them. The counsel for the complainants is George M. Robeson, formerly Secretary of the Navy.

Some six years ago a charter was granted by the Rhode Island Legislature to F. B. Hayden, William Mansir, J. T. Jackson "and their associates," for a corporation by the name of the American Manufacturing Co., "for the purpose of manufacturing textile fabrics," with an authorized capital stock not to exceed \$100,000. When, a short time later, a movement to organize a trust was entered upon by certain rubber-manufacturers of New Jersey, they seem to have purchased the charter above referred to—which appears never to have been used—as easier of accomplishment than procuring an original charter. It was amended to suit their purposes, by an act passed at Providence at the January session of the Legislature, 1886, thus:

IT IS ENACTED BY THE GENERAL ASSEMBLY AS FOLLOWS:

SECTION 1. Section 1 of the act entitled "An act to incorporate the American Manufacturing Co." is hereby amended so as to read as follows:

"SECTION 1. F. B. Hayden, William Mansir, J. T. Jackson, B. F. Goodrich, Thomas A. Bell, James F. Brook, and Joseph Whitehead, their associates, successors and assigns, are hereby made a corporation by the name of the Central Rubber Co., for

the purpose of buying, selling and dealing in crude rubber, rubber-manufacturers' supplies, and rubber goods; with full power and authority to acquire, hold, operate and dispose of any properties or interests therein for the manufacture of rubber, rubber belting or other articles of which rubber is a component part; and for the transaction of any business connected therewith or incidental thereto; with all the rights, powers and privileges and subject to all the duties and liabilities set forth in chapters 152 and 153 of the Public Statutes and in any acts in amendment thereof or in addition thereto."

SECTION 2. Section 2 of said act is hereby amended so as to read as follows:

"SECTION 2. The capital stock of said corporation shall not exceed \$2,500,000, to be fixed in amount from time to time by the by-laws or vote of the corporation. Said stock shall be divided into shares of \$100 each, and shall be transferred in such manner as shall be prescribed by the by-laws or vote of the corporation."

SECTION 3. This act shall take effect immediately.

The Trust formed under this charter embraced the Trenton, Star, Hamilton, Mercer and Home rubber companies, Whitehead Brothers and J. F. Brooks of Trenton; the Erie (Pa.) Rubber Co., and the B. F. Goodrich Rubber Co., of Akron, Ohio. The Trust was placed in charge of 51 per cent. of the stock of each of these companies and received dividends upon the same, out of which dividends were paid to the stockholders in the Trust. The parties who bring the suit purchased stock outright and did not receive it in exchange as the originators did. They charge in their bill that from the time of the incorporation until early in 1890 valuable assets were secured, but that in that year the business resources of the Trust were sacrificed by the gross neglect and mismanagement of the directors and officers, its property dissipated and lost, its valuable assets wrongfully disposed of for the benefit of persons and interests other than those of the company and its stockholders, and that this was done by and with the assent and concealment of the directors (or some of them) and their associates, in fraudulent violation of their duties and trusts.

It is further charged that in the autumn of 1890 an attempt was made to wind up the Trust by surrendering the stock held by it to the individuals from whom it was obtained and receiving its own stock in exchange. This scheme left out those who had paid cash for their shares, and an injunction was secured preventing the dissolution. In disregard of this, however, a meeting of the directors was held and an unsuccessful attempt made to dissolve. The Trust continued until the failure of the Star, Hamilton and J. F. Brooks companies, when, being afraid to attempt to sustain the losses occasioned by these heavy failures, a secret meeting was held in another State, the shares given in exchange for certificates of the Trust returned and the Trust declared dissolved, thus leaving in the lurch the stockholders who had made bona fide purchases of stock.

It is not yet known what answer to these allegations will be made by the defendants in this case.

Mr. Flint on Combinations.

AN address was delivered by Charles R. Flint, of New York, before the Commercial Club of Providence, R. I., on April 30, on "Industrial Combinations," touching "the use—not the abuse—of such combinations." Particular interest attaches to this address at this time, in the rubber trade, not only because of the ability of the author and his eminence as a successful business man, but because of the important position which he is supposed to hold with regard to the new rubber combination, he being the treasurer of the New York Commercial Co., a house engaged largely in the crude-rubber trade, which is understood to hold close relations with the United States Rubber Co.

"Manufacturing consolidations," said Mr. Flint, "are neither more nor less than the natural growth and expansion of our manufacturing interests, and whether there be absorption of one by another, or the union of two through consolidation, is of no moment. The result is an aggregation of intelligence and capital, which means an extension of manufacturing interests. They are the highest development of manufacture, as extended railway systems are the highest development of transportation on land, the ocean greyhound of transportation on the sea, the national banking system of exchange, the telegraph and telephone systems of communication.

"Such grand results can only be achieved by a combination of wealth and intellect, which centers in a few vast powers and responsibilities, but distributes its benefits, not alone among the rich, but into the homes of the humblest citizens, making life more comfortable, and, therefore, happier and better, and reaching, by its influence, the remotest corners of the earth. Industrial combinations represent union as distinguished from the purchase by one of another competing interest, or the destruction of the weak by the strong, of the unintelligent by the intelligent, of the unskilled by the skilled manufacturer, through the inexorable laws of competition.

"They present only a larger and more cohesive aggregation of intelligence and wealth than previously existed. Yet just as men have opposed the formation of corporations, the expansion of great railway systems, just so there are now found those who would restrict the natural development of our manufacturing industries. Every American citizen is interested in the discussion of these questions, and of their right solution." * * *

"The union of manufacturing interests, and the consequent subdivision and simplification of labor, means cheaper production. Take a case of specific result with which I am familiar:

"The consolidation which has recently been effected of the rubber boot-and-shoe manufacture is the best example I am able to give of the general principles I have outlined. There were sixteen corporations engaged in this industry; each of those sixteen companies, in order to meet the fierce competition of rivals, had been making over five thousand kinds of boots and shoes, when sizes, qualities and styles were considered, and that great variety necessitated buy-

ing annually thousands' of dollars' worth of lasts of different styles and sizes, and patterns and dies had to be made to match each different size and style of last. Now, with these companies united under one direction, not only will there be a large reduction in the cost of lasts and patterns and dies; not only will there be a large saving from the simplification of labor, in general expenses and through the increased capacity of each plant; not only will there be a saving of over \$300,000 annually in interest, insurance and depreciation by the consolidation and consequent reduction of stocks of goods and materials, but through a comparison of compounds and methods, the best systems will be selected and improved upon. Each factory, making but one class of goods, its output will be so large of that particular class as to warrant the creation of special machinery and the combination of inventive genius will not only have the advantage of a full knowledge of what each concern has evolved, heretofore jealously guarded, but will be untrammelled by patents or otherwise in the adoption of the best methods.

"The materials entered into the manufactured articles will be secured at the lowest possible cost, by purchase or by independent manufacture. Again, in one town there is a surplus of female help, which can be turned to making shoes. In another section there is a scarcity of women and an excess of men, who can be turned to the manufacture of boots. The manufacturing will be so classified and regulated as to insure a continuous production. There is nothing so harmful to manufacturing industries as spasmodic manufacturing, nor is there anything so harmful to the laborer employed. If a factory run one week, and it be uncertain whether it will run the next week or not; if it run one day and periodically shut down the next day, the interference with economy and the harmful influence upon the laborer, and upon the capitalist as well, are readily appreciated by those who are conversant with the financial demoralization arising from such a condition.

"The advantages of these combinations are precisely the advantage which came from the original introduction of manufacturing into this country. Alexander Hamilton classified them thus:

"1. The division of labor.

"2. An extension of the use of machinery.

"3. Additional employment to classes of the community not ordinarily in the business.

"4. The promotion of emigration from foreign countries.

"5. The furnishing of greater scope for the diversity of talents and disposition which discriminates such from each other.

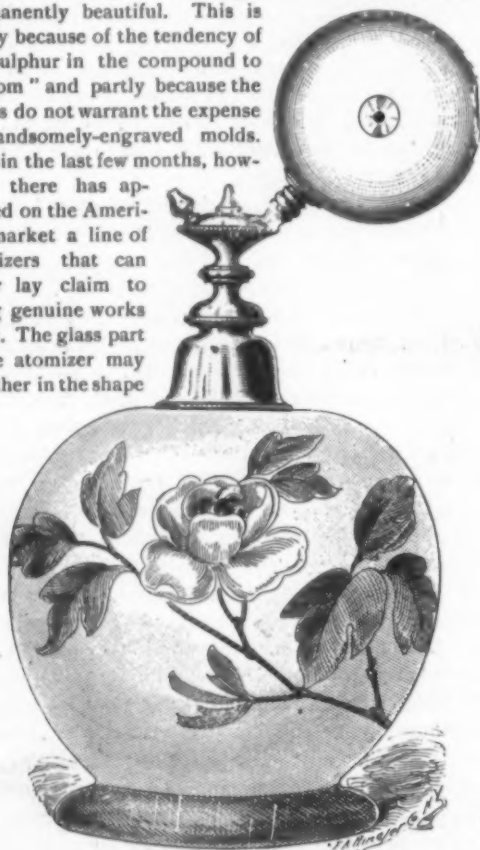
"6. The affording a more ample and various field for enterprise.

"7. The creating in some instances a new, and securing in all a more certain and steady demand for the surplus product of the soil.

"Another reason for the consolidation of several concerns into one great concern arises from the desirability of having property in a condition so that it can be readily divided or sold and not dependent for its continued success on the life of any one man."

NEW GOODS IN THE MARKET.

THERE have long been useful goods in great plenty made of India-rubber. There have also been some goods that might lay certain claims to beauty of finish and to artistic design, but they were few in number and were confined chiefly to hard rubber. There was a time when rubber jewelry was considered very beautiful. To-day, however, it has but little sale and probably never will be popular again. Pen-holders made of hard rubber with gold mountings are works of art, and some very beautiful combs are produced. In soft rubber, however, it is very difficult to get a finish or a color that will be permanently beautiful. This is partly because of the tendency of the sulphur in the compound to "bloom" and partly because the goods do not warrant the expense of handsomely-engraved molds. Within the last few months, however, there has appeared on the American market a line of atomizers that can justly lay claim to being genuine works of art. The glass part of the atomizer may be either in the shape

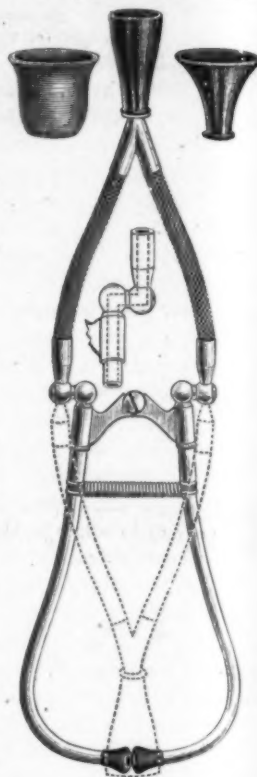


FANCY RUBBER ATOMIZER—NO. 318.

of a fancy glass bottle or an elegant cut-class jar. It may be plain with gorgeous trimmings, or may have sprays of flowers painted upon it by hand. For those who are more particular, silver and gold bottles are furnished. The metal parts are either nickel or silver and are very handsomely finished. The rubber bulb is made of red rubber of an exceedingly handsome shade that by a secret process is entirely free from all sulphur bloom. These atomizers are made in a very great variety and are very generally used on the toilet table. They range in price from \$6 to \$144 a dozen and are to-day kept in stock in the finest drug-stores in the land. There will also undoubtedly be a very large sale of them among those who have the better class of rubber stores, as they are by far the most showy articles in the rubber line that have ever been produced and attract attention whenever they are put in show windows. Manufactured by Ellis & Goltermann, No. 88 Leonard street, New York.

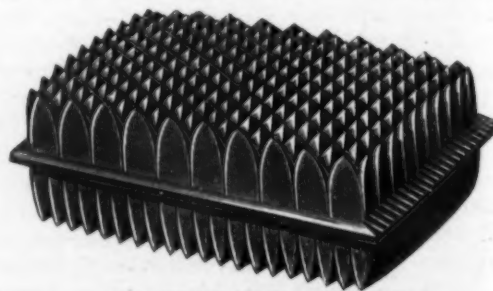
Folding Camman Stethoscope.

DEALERS in Surgical Goods are warmly praising an instrument that is manufactured by a prominent druggist sundry house in Pennsylvania. It is known as the Folding Camman Stethoscope. The following advantages are claimed for it: It is made all in one piece and folds in the center, instead of pulling apart as in the old-fashioned style; making it far more compact and easier to handle; the metal parts are made of the best brass and are handsomely nickel plated; the flexible tube is silk-covered, having at its base a steel wire spring covered with the best quality of pure band rubber. There is also furnished with each instrument a soft rubber bell to fit on the end of the hard rubber pieces to fit irregular surfaces. The cut shows the instrument extended, the dotted lines indicating the position of the two halves when folded together. This special feature of compactness, one that every user will appreciate, is but one of the many excellencies of the stethoscope. Every part is so carefully finished, and it is as a whole so simple, durable and practical that it is by far the best of its kind that has been marketed. Manufactured by the J. Ellwood Lee Co., Conshohocken, Pa.



Excelsior Rubber Toilet-Brush.

THE advantages of the Excelsior Rubber Toilet-Brush, made by the Seamless Rubber Co., of New Haven, Conn., are many and varied. Having two surfaces, one diamond-pointed and the other corrugated, it is fitted for the use both of mechanics and ladies. The diamond surface will make a rough skin soft, and the corrugated surface will keep a soft skin from getting rough. Owners of this brush do not have to use special prepa-



EXCELSIOR RUBBER TOILET-BRUSH.

rations for removing grease-spots from clothing, for the brush will do it with simple soap and water. Moreover, it is specially convenient in bathing, having the unusual power of floating.

The Tyrian Plant-Sprinkler.

FOR "the flowers that bloom in the spring" there is nothing more appropriate than the new Tyrian Plant-Sprinkler, for which a very large number of orders have already been taken. Described briefly the rubber part is made of white rubber of the very best quality. The metal parts are fitted with a self-



closing valve which is automatic in its action and allows the bulb to fill easily.

The metal is so attached to the bulb that there is no chance for leakage nor can the top of the sprinkler blow off, a common and troublesome accident with ordinary plant sprinklers. The spray thrown by the sprinkler is exceedingly fine, and taken altogether the utensil is one that can be used very effectively not only in households but to a certain extent in small greenhouses and by florists in general. Manufactured by the Tyer Rubber Co., Andover, Mass.

The Davidson Pencil-Holder.

A DEVICE is now manufactured by the Davidson Rubber Co., No. 10 Milk street, Boston, which does for pencils what a cigar-holder does for cigars, enabling them to be used to the end—leaving no stump to speak of. This pencil-holder outwardly



DAVIDSON PENCIL-HOLDER.

resembles a stylographic pen, having a hard-rubber barrel. At one end is an adjustable metal collar, into which the pencil is inserted, and at the other a rubber eraser. The cut given herewith shows the pencil-holder full-size.

The Gem Nozzle.

A NOZZLE that will throw either a coarse or fine spray, or a large or small solid stream, is one that is known as the Gem. The spray or stream, or the shut-off on the nozzle, is easily controlled



THE GEM NOZZLE.

by simply turning the sleeve around the body or center. A great variety of forms of spray can be produced, from a heavy shower to a very fine mist. The spray can also be regulated to cover either a large or a small space. These nozzles are exceedingly simple in design and have no plug-cocks, cams, rubber or leather valves, packing or disks to get out of order. By attaching the hose to a small stand a very pretty variety fountain may be made. In use, if the joint around the packing nut should leak after long service, the nut can be easily unscrewed and re-packed with cotton wicking dipped in tallow. This can be done by any one, while almost

all other hose-pipes must be taken to a mechanic and ground in and refitted at an expense nearly equal to the first cost. Manufactured by King & Goddard, No. 29 Pearl street, Boston, Mass.

New Footwear and Garments.

THE India-Rubber Glove Co. are placing upon the market a new slipper which differs from the "Storm" pattern in that it has a light pure-gum goring to fill the space on each side, which is one of the peculiarities of the popular shoe, and which hitherto has been left open. This innovation gives a high-cut rubber, light, neat and tasteful, and at the same time it is more useful in emergencies for which the storm pattern claims to be peculiarly advantageous. The prices of this style of goods, which has been named the "Blizzard," are as follows:

Men's.....	\$1.10	Fleece-Lined—	Men's... ..	\$1.40
Women's.....	75		Women's... ..	1.05
Misses'.....	62	With cloth top—	Men's.....	1.60
Children's.....	55		Women's... ..	1.35

The company have also been very successful in placing upon the market a bronze shoe for use with tennis goods. The color is a delicate russet and is in line with the skill displayed by this company in all of its work, and so far, in this instance at least, it is unapproachable. The tastefully-colored rubber will be strangely perverse, if it does not become popular. Some of the coats manufactured by this company are worthy of unusual mention. One can now step into the Broadway store of this and other companies, leave his measure, and get a garment, which in style, cut and finish will be as good as though he had gone to the best tailor for ordinary daily attire. His coat bought now will look exactly like the usual spring garment, though it will be in addition, waterproof. A garment made by the India-Rubber

Glove Co. in melton, lined with wool plaid, silk sleeves, finishings and trimmings of the best, can be gotten up for \$27.50 or \$50, or more or less than either, prices being as variable as in the clothing store, and of course dependent upon style, finish and quality.

A New Bathing-Cap.

THE Williams Rubber Co., No. 8 College Place, New York, are placing upon the market a new submarine bathing-cap, for which it is claimed that it will positively keep the hair dry, and the need for such an article is shown by the large sales that are being made of it. Places in which it was hardly believed that there were any facilities for bathing are calling for these articles in a way that would lead one to believe that they are indispensable. As a convenience, especially for ladies who crimp their hair, they are undoubted, and as they become more and more known, the sale promises to be very large. They are patented. The accompanying cut illustrates the form. The improvement in chief is a tight but very elastic rim, one-half inch wide, which, when on the head, hugs the scalp closely, allowing no water to pass under it. In the old style the gathering of the material on an elastic cord does not prevent the water from creeping in between the gathers. The color is of a light tan, and it is sold at a price of \$8 per dozen. The same company have brought out an ophthalmologist's antiseptic cap, for covering the hair while operating on the eyes, etc., a use which will readily suggest itself to medical practitioners. It



is constructed upon the same principle as the bathing cap and answers the purpose required of it very fully. These caps may be drawn over one or both ears, or even the beard when necessary.

The "D. B." Newmarket.

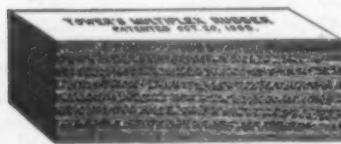
It is often remarked among retailers of rubber clothing the country over that the goods of the American Rubber Co. have a reputation that is unrivalled. This comes both from their elegance in style and from their exceeding durability. The accompanying illustration shows what is known as the "D. B."



Newmarket, which is one of the newest of new patterns for ladies' wear. It is a close-fitting garment, double-breasted with a box-front. It is made in the usual sizes for ladies and misses and there are more than fifty different patterns of coth for the retailer or consumer to choose from. This garment retails all the way from \$5 to \$20 and is quite as stylish as the most fastidious could wish. Manufactured by the American Rubber Co., Boston, Mass.

Tower's Multiplex Rubber Eraser.

It goes without saying that the man who can justly claim to be the pioneer in the manufacture of erasive rubber should know pretty nearly what is wanted in that line. The trouble with almost all of the infinite variety of rubbers that have been put upon the market is that they smut the paper. After a deal of experimenting, however, this has been overcome by the invention of what is known as the Multiplex erasive rubber. It is made of thin sheets of specially-compounded stock, cemented together and vulcanized in that shape. During vulcanization the cemented portions become porous, and the result is a block of rubber that is full of minute air-holes. In this form it hugs the paper, never hardens, and cannot smooch. This has been en-



TOWER'S MULTIPLEX RUBBER ERASER.

dorsed by the leading artists and bankers in the country, and the sales are constantly increasing. It is sold by the pound, and is put up in a variety of sizes running from 6 to 60 to the pound. Manufactured by the Cutter-Tower Co., Boston, Mass.

Nute's "Patrolman's" Shoe.

THOSE whose duties oblige them to travel a great deal on wet sidewalks will welcome a shoe made by L. M. Nute, of Great Falls, Mass., which is easy, soft, flexible, water-tight, high-cut, and noiseless, and which is consequently just the thing for patrolmen, policemen, old men and sportsmen. The vamp is



made of the best calf or Milwaukee grain; the top of cordovan or dongola; the inner sole of smooth sole-leather; the middle sole of sole leather and the outer sole of rubber. The shoe has a spring-heel. The sizes range from five to eleven, and in width from three to seven, and the style includes common square-top Bals, high-cut Bals, and Congress.

The "Monarch" Atomizer.

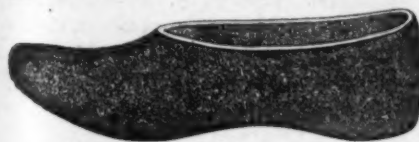
THE Vant Wond Co., of New York, have placed a new atomizer on the market, called the "Monarch No. 4." It has a hard-rubber tip with a continuous spray, but the principal advantage consists in a soft-rubber nasal-plug which slips over the tip, and obviates the necessity of unscrewing the latter and rendering the atomizer less liable to get out of order. Another advantage consists in the ap-



plication of the soft-rubber to the nostril, which from its pliability makes its use more pleasant and at the same time more efficacious than the ordinary hard and necessarily unyielding tip. This atomizer, which is illustrated by the accompanying cut, sells for \$5.50 per dozen, and is reported to be an excellent seller.

Parker's Gray Felt Slipper.

A VARIETY of cheap sheepskin slippers have for some time past been sold for wear inside of rubber boots, they are however, far from satisfactory, and a better article is called for. At the same time for the masses, it must be something that is very



simply made and of low cost. What is called "the best slipper in the market" to-day for the

money is Parker's Gray Felt Slipper. This is made in men's, women's, boys', misses', youths' and children's sizes and is for sale by all the leading jobbers the country over. In spite of the fact that it is a low-priced article, it is manufactured with the same care and attention to detail that characterizes all the goods made by this firm. Manufactured by John H. Parker, No. 103 Bedford street, Boston.

The Storm Alaska.

IT is said that imitation is the sincerest form of flattery. The company therefore who put the Storm Slipper upon the market, and who find that other manufacturers are following with high-cut shoes of their own should feel complimented. Certain it is that the high-cut rubber shoe has so many genuine points of excellence that until something a great deal better appears it will hold the field against all comers. The Storm Slipper has already been described and illustrated in these columns. A shoe that bears a great similarity to this popular style is what is known as the Storm Alaska. It is high-cut, has the same graceful contour and fits as neatly, the main differences being that the upper is cloth, and the shoe is fleece lined. It will protect the foot as well as an arctic and has no troublesome buckles. There is no reason to doubt that this will be the popular cold-weather shoe for ladies. Manufactured by the Boston Rubber Shoe Co.

**Leather Soles on Rubber Boots and Shoes.**

THERE are various ways of attaching leather soles to rubber boots, but only one that has thus far been thoroughly satisfactory and successful. That is covered by a patent which was issued to John H. Parker of Boston. The boot which he puts on the market has a rubber upper, made by the Boston Rubber Shoe Co., and which has a sole of fibrous material, exceedingly strong and thoroughly waterproof, and excellently adapted for attaching the leather sole. The sole is put on with head-and-clinch nails, so there is no possibility of its tearing itself loose,



or the dampness forcing its way through. The boot has a solid leather insole and outsole. It is used by contractors, miners and engineers, and is the only rubber boot that can be used by workmen who are digging drains or using spades. One special advantage in the leather sole is that when it is worn out, it may be tapped. These boots are also made for sportsmen and have become very popular with that class. Oftentimes the thigh boots have the heels nailed with

hungarian nails, so that in wading they cut the slime from the rocks, and prevent slipping. For placer miners and hard and soft coal miners the soles are made either with the rolled edge or are studded with special nails. The illustration shows a lumberman's shoe with the patent leather sole for which it is especially adapted, the upper being made by the Boston Rubber Shoe Co.

New Publications.

RECORD OF SCIENTIFIC PROGRESS FOR THE YEAR 1891, EXHIBITING the Most Important Discoveries and Improvements in all the Branches of Engineering, Architecture and Building, Mining and Metallurgy, the Mechanic Arts, Industrial Technology and the Useful Arts, Photography, Chemistry, Medicine and Surgery, Printing, the Generation, Measurement, Transmission, and Application of Electricity, the Telegraph and Telephone, Meteorology and Aeronauty, Astronomy, etc. By Robert Grimshaw, M. E., Ph. D. New York: Cassell Publishing Co. [8vo, cloth, 372 p., \$1.50.]

IN this book, which Mr. Grimshaw dedicates to The Franklin Institute of the State of Pennsylvania for the Promotion of the Mechanic Arts, he has collected and conveniently classified from the files of the special periodicals published during 1891 and from other sources many useful scraps of information regarding technical progress. The department of steam-engineering holds the position of honor, and steam is characterized in the opening paragraph as "still king of the forces by which civilized man is enabled to make progress against those of nature"; but, nevertheless, when the author comes to the department of electricity, he is compelled to devote to it three times the space that any other department receives, and this too in spite of the fact that separate departments are given to telegraphy and the telephone. Among other evidences of progress is noted the use of asbestos in connection with India-rubber for gaskets, woven washers, and woven tape for making steam- and water-joints. From such a work as this one can form some idea of what a year's growth means in the life of man collectively considered. Its usefulness is greatly enhanced by a voluminous and carefully-prepared index.

AMERICAN NEWSPAPER DIRECTORY, CONTAINING A DESCRIPTION of all the newspapers and periodicals published in the United States, Dominion of Canada and Newfoundland, and of the towns and cities in which they are published. Twenty-fourth year. New York: Geo. F. Rowell & Co. [8vo, cloth, 1648 p., \$5.]

THIS very useful annual is now published for the twenty-fourth time. We learn from it that during the year 2721 new journals appeared in the countries covered and that 1826 journals suspended publication, showing an aggregate increase of 895. The publishers have adopted a system of circulation-rating by which they have secured five times as many sworn statements of circulation in detail as they were ever able to get for any previous directory. This publication is almost indispensable to journalists and advertisers.

An English Rubber Factory Falls In.

THE Boston *Herald's* cable service on May 7 contained this despatch from London:

"The Mackintosh company's rubber factory at Manchester collapsed to-day. The factory was full of employes. They were first startled by a rumbling sound as of thunder, and, looking up, they saw the roof cracking and splitting. All rushed for the exit, but in an instant the roof came down, burying a number of people. The air was filled with a cloud of dust and debris, and shrieks and groans of the sufferers could be heard for a long distance. Work was at once begun to get the victims out of the ruins. There have already been ten taken to the hospital, and of these three were seriously injured, and one in a dying condition."

Obituary.

WILLIAM FRANKLIN HOLLIS died at a hotel in Philadelphia on Friday, April 8, after a brief illness not thought to be dangerous. For seventeen years he had been in the employment of the Davidson Rubber Co. and it was in the capacity of traveling representative for that company that he happened to be in Philadelphia. He was born in Boston, July 14, 1859, and educated in the public schools of Charlestown, being graduated from the Bunker Hill School in 1874. He entered at once an insurance office in Boston, where he was employed but a short time, going from there to the Davidson Rubber Co. in 1875.

He was engaged as entry clerk and assistant book-keeper at the Boston office of this firm and as his duties were comparatively light the first few years of his service, a part of his time each day was spent at the factory in Charlestown, where an opportunity was presented for becoming somewhat acquainted with the details of the manufacture of medical, surgical and stationers' rubber goods, the specialties of this firm. Thus he became peculiarly qualified for the duties of a salesman, which he assumed in 1885. Up to this time the house had no representative on the road other than a monthly visit to New York by one of the firm. Convinced, however, that it would be to the advantage of the firm in its rapidly increasing trade to have closer and more direct relations with its customers, it was decided to send Mr. Hollis to represent the business, and since January, 1885, he has had charge practically of selling the products of the firm. From the first he was most cordially received by the trade. His happy disposition, his thorough knowledge of and confidence in the goods he sold, his integrity and honesty of purpose, together with the high esteem in which he was held by his employers were doubtless the great factors that contributed to his success as a salesman.

His home was with his brother, No. 27 Marshall street, Charlestown. Three years ago the death of a sister was a severe blow from which he never recovered. The funeral occurred at Charlestown on April 12, the Rev. I. P. Codrington conducting the service.

The First Year of a Dresden Company.

THE first annual report of the Sächsische-Böhmische Gummi-waren-Fabriken [Saxon-Bohemian Rubber Manufacturers] of Dresden shows a loss of 49,142 marks, which they look upon as a most natural thing for the first year and attribute to the increase of factory space, the purchase of machinery for new styles of goods and for labor-saving and to a slight depression in trade. No fault is found with the management as regards economy, but the salesmen are cautioned to be more alert in future as that is the direction in which they look for the profits during this year, of which they are quite hopeful, as the books show an increase of 50 per cent. over last year for the months of January, February and March. A noteworthy item in the report is that except in one instance they have suffered no

loss by the failure of customers. The concern was formed but a year ago with a capital stock of 1,000,000 marks. It operates two factories, one in Löbtau and the other at Bünanburg, with the main office and ware-rooms in Dresden. The officers are: President, J. Paul Liebe, who is also the manager of the factories; vice-president, Henry Palmie; councillor of commerce, Clemens Henschkel (Director of the Saxon Bank of Dresden); financial advisor, Franz Nowating; capitalist, Heinrich Patzman, and security, Albert Gooss.

Rubber-Goods Exports From New York.

THE declared value of exports of "India-Rubber Goods" from the port of New York for the four weeks ending April 26, 1892, is shown in the following table, together with the total value of similar exports from the beginning of the year. The value of this table may better be understood when it is mentioned that the exports of rubber goods from New York amount to about 53 per cent. of the total shipments of such goods from the United States.

To—	Four Weeks.	Since Jan. 1.	To—	Four Weeks.	Since Jan. 1.
Amsterdam	\$ 111	\$ 111	Gijon	\$ 8	\$ 8
Antwerp	2,905	5,911	Glasgow	600	1,200
Argentina	60	60	Hamburg	329	8,647
Berlin	296	1,336	Havre	3,774	44,351
Bombay	56	56	Hayti	31	407
Bolivia	1,385	1,385	Hong Kong	24	404
Brazil	4,377	6,170	Japan	810	4,492
Bremen	50	1,085	Lepaic	32	179
British Africa	240	240	Liverpool	1,476	4,038
British Australia	3,945	8,519	London	2,184	7,482
British Honduras	69	69	Marseilles	—	1,003
British E. Indies	—	129	Mexico	1,562	7,233
British W. Indies	143	1,154	Moscow	3,062	3,062
Budweis	—	432	Newfoundland	188	446
Central America	978	3,814	New Zealand	189	212
Chili	169	1,019	Peru	67	547
Christiania	456	945	Philippines	85	85
Colombia	440	2,017	Porto Rico	203	444
Constantinople	—	55	Rotterdam	543	2,787
Copenhagen	727	2,143	San Domingo	13	43
Cuba	911	6,504	Sandwich Islands	—	192
Danish W. Indies	8	82	St. Gall	—	386
Dutch E. Indies	38	114	Venezuela	267	1,614
Dutch W. Indies	—	192	Vienna	—	212
Ecuador	156	433	Zurich	—	228
French W. Indies	—	15			
Genoa	—	2,378	Total	\$31,157	\$150,864

The value of crude India-rubber exported from New York during the same period of four weeks is given in the next table. These shipments have been above the average of late, and it may be that they mark the beginning of a new era in the world's movement of crude rubber—one in which New York rather than the great European ports shall be the center of distribution for the output of the Amazonian rubber forests. The exports were:

To—	Packages.	Value.	To—	Packages.	Value.
Genoa	116	\$ 1,300	London	689	\$90,360
Hamburg	34	1,069	Peru	2	44
Havre	193	2,850			
Liverpool	427	69,000		1,461	\$164,623

Exports of India-rubber scrap were made to Glasgow to the value of \$2032; to Hamburg, \$800, and Japan, \$231. The shipment is reported of two bales of sheet-rubber, valued at \$55, to the United States of Colombia. The total for four weeks of all the items named above was \$198,888.

THIS is an example of the shape in which the news of the combination reached the rubber-growing countries, being a despatch published in the *Panama Star and Herald*: "Trenton, March 31.—The organization is announced of the United States Rubber Co., with a capital of \$50,000,000, by Flint, Jones and others. It is said that this company will control the rubber production of the world." It might be interesting to know who is "Jones."

TRADE AND PERSONAL NOTES.

ARTICLES of incorporation of the Empire Rubber Co. have been recorded at Trenton, N. J. The objects stated are the purchase, manufacture and sale of all descriptions of rubber goods, oil- and rubber-cloths, belting, hose and other fabrics. The capital authorized is \$250,000, divided into 2500 shares at \$100 each. Business will be commenced on a paid-in capital of \$167,000, divided into 1670 shares. The incorporators and present stockholders, together with the number of shares held by each are as follows: Frank A. Magowan, Trenton, 700 shares; George R. Cook, Princeton 250 shares; William H. Skirm, Trenton, 320 shares; Allen Magowan, Hamilton township, 300 shares, and William P. Hayes, Trenton, 100 shares.

—The Asbestos Pulp Co. have filed a certificate of incorporation at Rochester, N. Y. The incorporators are Arthur H. Green, Eli M. Upton, Albert S. Bigelow, Michael Doyle, Luther M. Hair, Fred W. Munson and Frank H. Munson. All but the last two mentioned are residents of Rochester and the latter two of Watertown, N. Y. The capital stock of the concern is \$300,000, all of which has been paid in. The manufacturing of asbestos will be conducted in St. Lawrence county, while the principal business office will be in Rochester.

—The Newport (R. I.) Elastic-Fabric Co. have begun work in a portion of the old Newport Manufacturing Co.'s building. This new concern is an outgrowth of the strike at the factory of the E. Read Goodridge Manufacturing Co., and is under the management of Edwin F. O'Brien, lately foreman for the latter company. The sixteen or eighteen weavers employed are also strikers who, upon leaving the Goodridge factory, found themselves "posted," and unable to find employment elsewhere. It is claimed that the new company is backed by sufficient capital, that the capacity of the works will soon be increased, and that the entire production is to be taken by one house. Mention is made of a valuable improvement on a loom controlled by Mr. O'Brien; also that a 25-horse-power electric motor has been contracted for to run the machinery of the new plant.

—The annual meeting of the National India Rubber Co., at Bristol, R. I., was held on April 12. The officers were re-elected, as follows: President and treasurer, Samuel P. Colt; vice-president, John C. Balderston; superintendent, Isaac F. Williams; secretary, C. E. Emerson; directors, F. M. Shepard and Charles Lowenthal of New York, John McAuslan of Providence and Samuel P. Colt and Joshua Wilbourn of Bristol. It is stated that business at the factories of the company looks very promising. Some of the departments are driving business. The boot department is very quiet, but the lawn-tennis shoe and gaiter departments, with the hose and clothing, are doing well.

—The Boston Rubber Co., whose factory is located on Winnisimmet street, Chelsea, Mass., have purchased, taking possession on May 1, the adjoining large property owned by Bisbee, Endicott & Co., iron-workers, bounded by Division, Williams and Pearl streets, with all the large frame buildings, machinery and materials, and the wharf property on the harbor front, extending from near the ferry slip to the Meridian street bridge, all containing some 100,000 square feet of land.

—The American Rubber Co. report a large demand for their English Sole tennis-shoe. It is made in black and check and the new sole which prevents the wearer from slipping. It is designed for sale at a little lower price than the "American" brand. The "Pedestrian" Oxfords are selling handsomely, and a new "Piccadilly" width is in good request.

—The New York Insulated-Wire Co. have removed to No. 15 Cortlandt street, which is a superior location for the interests which they represent. Mr. J. W. Godfrey has lately returned from a successful trip for the company to the Pacific coast.

—The Sears Commercial Co., Limited, being in liquidation, the good-will of the business has been transferred to R. F. Sears, and will be continued at No. 141 Pearl street, New York, under the firm style of Sears & Co., and at Pará, Brazil, under the firm style of R. F. Sears & Co. Mr. R. F. Sears, the founder, has been for a number of years President of The Sears Commercial Co., Limited, and is senior member of the house of R. F. Sears & Co., of Pará. He has had a large experience with Brazil, Bolivia, Peru and Central America, as well as his experience as a merchant in New York, and the firm are prepared to engage in the importation of any of the products of those countries, and also exports of American products to them. They will execute orders for rubber at Pará or Manáos.

—The Gutta-Percha and Rubber Manufacturing Co. for a long time have been placing a style of hose with city fire departments which seems to have given them the "call" in that direction. Formerly fire hose weighed as much as 1½ pounds to the foot, but by careful manufacture the weight has been reduced to 45 pounds for a length of fifty feet. To the fireman who has to pull up a mass of hose to the top of a tall building this is a boon which he only can appreciate. This hose is four-ply, 2½ inches in diameter, and will stand 400 pounds pressure. It is also carbolized and is stronger than the old-fashioned hose. A larger size is made by the same company, three inches in diameter, five-ply, weighing sixty-three pounds for fifty-foot lengths.

—The elastic-webbing business is on the increase, judging from the fact that Harriman Brothers, at Lowell, Mass., have doubled the size of their factory and filled it with machinery of the most improved character, and also that the Newport (R. I.) Elastic-Fabric Co. started in the latter part of last month with eighteen employes.

—W. A. Thornton, the new manager of the Cruikshank Engine Co., Providence, R. I., is driving things for all he is worth. He is at present doing considerable with rubber-manufacturers in the line of mold-work.

—Mr. Playter of England, who had a secret for coloring rubber, which he sold to rubber-manufacturers, was quite successful in raising money, as he secured the names of most of the rubber-manufacturers in the country, his price varying from \$5 to \$25, as circumstances dictated.

—Messrs. Hammill & Gillespie, No. 240 Front street, New York, who furnish a variety of adulterants or ingredients to rubber-manufacturers, are having quite a sale on Portland cement, which they make a specialty of furnishing to manufacturing plants.

—The Home Rubber Co., of Trenton, N. J., are running night and day, but are still behind their orders.

—The Woonsocket Rubber Co., although they do not encourage it, have a large mail trade on their tiny rubber boots. The boots of course are only playthings, but are so neat and pretty that almost every one who see them covets a pair.

—One of the oldest and best-equipped rubber Superintendents in the United States recently said "We shall soon be obliged to use metal trees for the manufacture of rubber boots and shoes, of that I am satisfied," a statement that will no doubt please our friend Mr. Charles F. Parker.

—The Mason Regulator Co., Boston, whose reducing valves are so largely used on vulcanizers, are about to double the size of their plant at Milton, Mass.

—The Standard Thermometer Co., of Peabody, Mass., have gone into the rubber business; that is, they have taken a contract for building the Hall typewriters, which includes the manufacture of the rubber type-mats used in that machine.

—Bayaud & Stevens, No. 60 New street, New York, are having a decided call for their asbestos flour from rubber-manufacturers of late. This is one of the best ingredients that can possibly be used in compounds for rubber goods.

—The Commonwealth Rubber Co., of New York, have moved into a fine store at No. 42 Vesey street. When stocked with their goods, and fitted up as they intend to have it, it will be one of the finest rubber-stores in the city.

—The Phillips Insulated-Wire Manufacturing Co., of Pawtucket, R. I., have just bought two ventilating-fans manufactured by the Barney Ventilating-Fan Co., Boston. If all rubber-manufacturers appreciated the value of these fans both for drying rubber and in freeing work-rooms from dust and foul odors, a good many more orders would come to this same concern.

—Mr. Eggers, the well-known mold-maker of Brooklyn, has moved his plant to No. 45 Center street, New York City.

—M. D. Williamson is now representing the New Jersey Car Spring and Rubber Co. in New York and vicinity, in place of E. H. Alcott, who has gone with Francis Reddaway & Co.

—The Gutta-Percha and Rubber Manufacturing Co. have just put a 400-horse-power Watts-Campbell engine into their Brooklyn plant.

—The Cleveland (Ohio) Rubber Co. have a daily capacity of 25,000 feet of rubber hose and 12,000 feet of cotton hose.

—The L. Candee Rubber Co., whose plant for the manufacture of rubber boots and shoes, is located in New Haven, Conn., use two large Corliss engines of 1400 horse-power each.

—"I am only a goat, but listen to my tale of woe," is the title of a gorgeously-illustrated pamphlet issued by L. C. Chace & Co., of Boston, to advertise their mohair plushes. The designs were suggested by Frank Hopewell, president of the company, and also president of the Reading Rubber Manufacturing Co., and is one of the most catching advertisements that has appeared in a long time.

—The general annual meeting of the stockholders of the Granby Rubber Co. was held at Granby, Quebec, on April 20, at which an adjournment was had to July 20, the date at which, under a change in the by-laws of the company, the fiscal year is to begin hereafter. The business of the company has been very large for the year just closed, the sales aggregating nearly half a million dollars.

—A new Goodyear rubber-store has been opened at No. 34 East Fourteenth street, New York. The proprietor is Mr. Edward W. Holt, well known as a manufacturer of rubber goods. The store has a department where ladies and gentlemen's mackintoshes are made to order, and the trade in that branch has already assumed very satisfactory proportions.

—The Mattson Rubber Co. in April had the largest month's business in dress-shields in their history. The corset-shield lately placed upon the market has sold fully as well as the most sanguine expected, and an additional floor will be taken for its manufacture.

—The Eureka Fire Hose Co., New York, report a fine business, they having been obliged to make some unusual efforts lately to catch up with orders.

—At the last town meeting at Winthrop, Mass., an appropriation of \$165 was made for rubber coats for the firemen.

—A jobber who is doing an excellent business in general mechanical goods all through the Atlantic States is Thomas J. Egan, proprietor of the American Rubber House, Trenton, N. J.

—James Ruddick, proprietor of two rubber stores in Fall River, Mass., is sending in orders to manufacturers that make them wonder if that part of the country is expecting a water famine and intend to cover it with garden hose and sprinklers.

—The Imperial Rubber Co., New York, have been doing an excellent business in dental rubbers, some recent orders having been received from Japan and China. Experts in this work are very few, even in this country, and the delicate tints of the College Place concern are in request everywhere from people who are not disposed to succumb without a struggle to Nature and "gum it."

—The Boomer & Boschert Press Co., of Syracuse, N. Y., report the recent sale of a 40"x40" vulcanizing press to the Atlantic Manufacturing Co., of Providence, R. I.,—a concern owned by Eugene Phillips, of the American Electrical Works. They have booked orders for three steam-plate presses for the Peerless Rubber Co., of New Durham, N. J., and one for the Rubber-Step Manufacturing Co., of Exeter, N. H.

—The Brockton Rubber Co. have received an order for 1000 feet of rubber tubing for the Brockton railway company.

—It is reported by the local newspapers that the projected Chester (Pa.) Rubber Co., of which mention was made in the last issue of this journal, is not likely to take shape, probably due to the influence of the establishment of the new rubber combination.

—In the matter of statements of the size of rubber stocks it is not safe always to depend too much upon statistics. There is no generally accepted method of keeping records of such stocks in this country, brokers exchanging information one with the other and thus forming estimates of the total amount of rubber in the market. An incident occurred not long ago in which a large amount of rubber was taken out of one of the storage warehouses under the Brooklyn Bridge, a place never used before for that purpose. This amount upset the calculations of every one, and it probably never found a place in any calculation of stocks afterwards. Brokers spend considerable money in getting this class of information, but they do not rely upon it absolutely when obtained.

—A store 100 feet long by 25 feet wide, light, airy, and handsomely-finished, is what the Commonwealth Rubber Co. have at No. 54 Vesey street, New York. In this they carry a full line of mechanical goods and with better facilities are prepared to serve the trade with even better satisfaction than heretofore.

—The "Jack" described in another column for use in rubber-boot making is manufactured by the Metal Last and Tree Co., No. 105 Summer street, Boston.

—Memphis, Tenn., is claimed, by the *Avalanche-Appeal*, of that city, to be an important rubber-trade center, being "the only city in the entire South that contains an exclusive rubber store." Reference is made to Towner & Co., who carry lines of fire-hose, belting and other mechanical goods, and boots, shoes and clothing.

—The Pittsburgh Rubber-Supply Co. (Nos. 23-27 Fifth avenue) have been formed by G. R. C. Johnston, J. Sherber and J. Hite, for the supply of rubber goods in all their branches, together with general mill and fire department supplies. They will represent leading and well-known manufacturers only, whose business in this territory will be altogether under their management. G. R. C. Johnston, in connection with the firm, will continue to represent the B. F. Goodrich Co. and The Goodrich Hard-Rubber Co., of Akron, Ohio.

—The Automatic Rubber-Mixer Co., of Boston, are placing two machines in the works of Goodyear's Metallic Rubber-Shoe Co., at Naugatuck, Conn. They have seven doing good work in the factories of the Glove company. They are not sold, but put in on a yearly rental.

—It is currently reported by the Paterson (N. J.) newspapers that the Bloomingdale soft-rubber factory will be converted into a silk mill.

—"Fifty-two years of success" is the way that the Brown-Desnoyer Shoe Co., of St. Louis, Mo., put it in the handling of the goods of the Candee Rubber Co.

—The St. Paul Rubber Co., at No. 50 East Third street, St. John, N. B., is mentioned as going out of the retail business.

—Miss Katharine A. Shaffer, of Harrisburg, Pa., has been granted a patent for a contrivance in the line of inflated rubber air-pads.

—The new mechanical-goods concern at Campello, Mass., organized by J. T. Nickerson, superintendent of the late Standard Rubber Co., and other employes of the latter organization, will be known as the Monarch Rubber Co. Land has been purchased from A. M. Thayer for building purposes, plans drawn for the buildings, and machinery ordered.

—The Boston Rubber-Shoe Co. have issued a circular announcing that the coming season they will sell rubber boots with leather soles put on under John H. Parker's patent. They say in this connection that they can thoroughly recommend these goods as being first-class in every particular, as they have been in use for eight years and have always given the best of satisfaction. They also remark that to the best of their belief the leather sole cannot be successfully attached to rubber uppers by any other than Parker's method.

—The sole-cutters, meaning those men in rubber factories who make their living by cutting soles by hand, have reluctantly acknowledged that machine-cut soles are bound to come. From their standpoint it is perhaps "kinder rough," but there is plenty of work for good men in other departments of rubber mills.

—The Enterprise Rubber Co. of Boston, who handle the goods of the New Brunswick Rubber Co., are very busy and report good sales in the brands of rubber shoes which they handle, namely: the goods of the Essex Rubber Co., the Norfolk Rubber Co. and the Columbia Rubber Co.

—It is reported that the "lead trust" are longing for a new scheme that will enable them to raise the price on litharge.

—The Chelsea Wire-Fabric Rubber Co., of Chelsea, Mass., are running their mill over hours and even now cannot fill orders.

—The call now is for a pneumatic bicycle-tire that will not pick up mud. Here is a chance for an inventor.

—A very interesting article, nicely illustrated, was recently published in the *Scientific American* describing the new cross-stitch belt which is being manufactured by the Boston Woven Hose and Rubber Co.

—What is probable the oldest vulcanizer in the world was recently taken out of the works of the Boston Belting Co. It was set up in 1830, and has been used almost continuously ever since.

—Charles T. Wood, who was formerly with C. M. Clapp, has opened an office at No. 67 Chauncy street, Boston, as a manufacturers' agent. He handles hose, belting, mats, and general rubber supplies, and carries a full line of rubber and oil clothing, and men's and women's mackintoshes. He has also opened an order department for ladies' mackintoshes which is in the charge of Mrs. Wood and which has already proved a valuable feature of the new business.

—It is to be noticed that in place of the former sign that adorned the agency of the New Jersey Rubber Shoe Co. in New York may now be read the words "United States Rubber Co."

—Eugene Pearl's corset shield has already been adopted for sale in thirty stores in New York and is said to be going very rapidly.

—The American Wringer Co. have found it necessary to enlarge their quarters in New York, taking the whole building at No. 99 Chambers street. The company formerly occupied the second story, but now will take the first floor and the basement in addition, which they are putting up in excellent shape to be ready for early occupancy.

—For some time past the Colchester Rubber Co. have been providing retailers of their shoes with waterproof signs that they can use as pasters on fences.

—The Colchester (Conn.) Rubber Co. are talking of putting in three of the 60-inch mixing-mills made by the Birmingham Iron Works. They have added also a new Berryman Feed-water Heater, and an upper calender made by Kelley, of New Brunswick, N. J.

—Frederick Sharp, proprietor of the rubber store at Pittsfield, Mass., having closed out his business, will open a hotel at Asbury Park, N. J.

—The new store of G. F. Gilmore, Newport, R. I., embraces a rubber-goods department.

ON THE ROAD.

EUGENE HERBERT, of the Atlas Rubber Co., New York, started on May 1 for a long trip, which will last three months or more. Taking in the large cities of the West, he will go to Texas, where he met with so much success last season. For a long time the company have been receiving, somewhat unsolicited, large orders from Mexico, and Mr. Herbert will make a reconnaissance in that country. There he will spend four weeks, going as far south as Vera Cruz, the City of Mexico and Colima. Of course he will see the smoking mountain of Popocatepetl, and the "White Lady," or Iztaccihuatl, but the stupendous grandeur of these volcanoes is forgotten by him in his anticipations when he thinks of that day-and-a-half in a stage-coach to be followed by another day-and-a-half on horseback on the trip to Colima. He fully expects to be "stood up" on the road by the usual agent found in the country, but has unlimited confidence in a weapon called the "Atlas" syringe, which if he does not neglect to fill it with some of the vile liquor found in frontier bars this side of the border, he thinks will be invincible in a squirt against any unwise "greaser" that may cross his path. His trip is as a pioneer in the rubber line, but there are indications to the shrewd that it will be successful. Mr. Herbert will visit also the towns on the Mexican National and Mexican Central roads.

—C. J. Bailey, the well-known manufacturer of rubber specialties in Boston, is taking three weeks to do the West on a business trip.

—Mr. F. G. Wilstach, of the Davol Rubber Co., of Providence, R. I., has started on a western trip, going by way of Montreal and Toronto. As Mr. Wilstach is just back from the Pacific coast the present trip will be but a short one.

—E. H. Paine, selling-agent of the American Rubber Co., has returned from a business trip of three weeks in the west.

INDIVIDUAL MENTION.

THE Hon. E. S. Converse has been mentioned already as a frequent visitor to Lakewood, N. J. An exchange says that he finds it a desirable resort in both winter and summer, and that as a real-estate owner there he is interested in the success of the place.

—E. H. Cutler, selling-agent of the Woonsocket Rubber Co., has secured summer quarters for his family at Plymouth Beach, Mass.

—George A. Alden, of the Boston rubber trade, has gone to his country house at Wellesley, Mass., for the summer.

—Costello C. Converse, of the Boston Rubber-Shoe Co., has been re-elected one of the vice-presidents of the Boston Boot and Shoe Club.

—The family of Francis Grauert, of New York, who recently accepted a position with Norton & Co., in Pará, sailed on the *Vigilanca*, May 6, to take up a permanent residence in South America.

—Charles Lowenthal was a passenger on the *Augusta Victoria* which sailed on Thursday, May 12, for Hamburg.

—George E. Barney, the energetic manager of the Barney Ventilating-Fan Co., of Boston, is off for a week's salmon fishing at Grand Lakes, Me., and may good luck attend him.

—The most disgusted man in New York City probably is Samuel F. Randolph, the president of the Commonwealth Rubber Co., who was drawn for jury duty in Brooklyn lately, and is serving much against his will.

—William B. Norton, correspondent at Pará for the New York Commercial Co., was in New York recently for a week's visit and has just returned to South America.

—Mr. E. Bruce Preston has left New York for a few weeks and gone back to that city where so many of his interests lie, and where the World's Fair is to be held.

—Walter H. Ballou, of the Woonsocket Rubber Co., is one of the many enthusiastic fishermen who are haunting Bangor pool for salmon. Last year Mr. Ballou brought home six, the smallest of which weighed eighteen pounds.

—President Horace H. Tyer, of the Tyer Rubber Co., Andover, Mass., is down at Nantucket, recuperating after severe illness.

—Mr. A. Randolph, manager of the Stoughton Rubber Co., of Boston, has been ill for a week past, but is now out again and attending to business with his accustomed energy.

—Among recent visitors to THE INDIA RUBBER WORLD offices was M. Felix Vieuille, Ingénieur des Arts et Manufactures, of Paris, who is interested in the rubber industry in France and who comes to this country with a view to inspecting the uses of machinery by our rubber manufacturers.

TRADE PUBLICATIONS.

THE Toronto Rubber Co. of Canada, Limited, issue a handsome illustrated catalogue of boots and shoes manufactured in their factories at Port Dalhousie, Ontario. An extensive line of shoes and boots is illustrated, offering something for every department of the trade. The catalogue closes with a list of prices. A suggestion to the trade occupies a prominent page:

"We consider it advisable to call the attention of both dealers and salesmen to the fact that the durability of rubber shoes is often much affected through lack of care in properly fitting the rubbers over the leather shoes on which they are to be worn. Neglect of attention to this point very often results in dissatisfaction for which the manufacturer is certainly not responsible. If dealers and salesmen will see that the soles or heels of the leather shoes do not project over the edges of the soles of the rubbers, much unnecessary annoyance can be avoided, the utility of the rubbers doubled, and more cheerful and satisfactory results obtained for all concerned."

The same company send out a general price-list, a book of 240 pages, embracing every kind of rubber goods found in the advertising publications of the leading American companies, many of the articles being shown in well-executed engravings.

—The Stephen Ballard Rubber Co. (No. 123 Chambers street, New York) issue a neat little pamphlet describing the "frictioned-surface" rubber belting protected by their registered trademark, "Duck." Prices and descriptions of their other brands of belting are also included, together with discount-lists.

—The Providence (R. I.) Steam and Gas-Pipe Co. send some new circulars describing the Grinnell Automatic Sprinkler and recording additional evidences of its value in providing protection from fire. A list of 1151 fires is given in which these sprinklers have operated without failure. The Boston Rubber-Shoe Co. and several other important rubber-manufacturing concerns are mentioned as using the Grinnell Sprinkler in their factories.

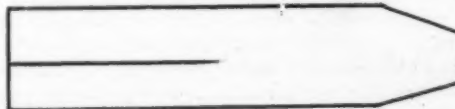
—The American Rubber Co. (Boston and New York) have issued a new catalogue, which can be called a work of art. The covers are nicely embossed, and the plates are neatly printed on salmon-tinted leaves with white borders. A complete telegraphic code is incorporated in the book which will be of advantage to jobbers ordering by wire. The company have reduced the price of their pure-gum goods to those of other houses, and report that the quality so well known will be maintained.

—On every page of the new catalogue of the Colchester (Conn.) Rubber Co., manufacturers of rubber footwear, are evidences of taste in the arrangement of the book that cannot fail to create a good impression with regard to the products of the company by those who read it. Every one in the trade who receives a copy of the catalogue will be inclined to preserve it, less on account of the injunction to that end on the first inside page than on account of its general attractiveness.

—An exceptionally handsome publication is the General Catalogue of the Standard Thermometer Co. (Peabody, Mass.)—a pamphlet of 71 large pages, containing engravings and descriptions of their thermometers, telemeters and other indicating instruments, most of which have been described in the smaller special publications of this firm which have been noted from time to time in this column.

Mr. Ballou's "Armour Fly."

MR. WALTER S. BALLOU, selling-agent of the Woonsocket Rubber Co., is an enthusiastic and successful fisherman. Trout, salmon and black bass are his game and he is likely to coax them to bite whether they are feeling that way or not. A black-bass fly that he has used when all other bait was vain is shown in the accompanying illustration. It is called



the "Armour Fly" for the very good reason that it is made of pork. Any one can make it and use it with profit for that matter if they know how. The directions are these: Take a piece of pork-rind about two-and-a-quarter inches in length and shave it thin cutting away the fat and leaving the rind. Cut the edges square, and from the square end split the rind about half way up. Bore a hole through the other end for the hook and the fly is complete. In using draw it through the water imitating as nearly as possible the motion of a frog in swimming. Some remarkable catches have been made with this bait properly used, and that too when "dobsons" and flies of all kinds had been treated by the bass with continuous and maddening contempt.

REVIEW OF THE RUBBER MARKET.

THE market during the past month has been in the main dull, although deliveries on future contracts have been very fair. Toward the latter part of April there was considerable animation, which extended into the first few days of May, when the market turned into a state of apathy, from which it has again emerged. The transition state of the companies embraced in the consolidation known as the United States Rubber Co. is perhaps responsible to a certain extent for this state of affairs, as they naturally would not carry any stocks until matters were fully determined for them. Importers this year have not made much profit in the market as a great many of their contracts have been at a loss. In Africans and Centrals there has been a good business, at fair prices.

The world's stock of Pará rubber on May 1, compared with April 1, is estimated as follows:

	April 1, 1892.	May 1, 1892.
United States.....	776 tons.	721 tons.
England.....	1490 tons.	1235 tons.
Pará.....	740 tons.	680 tons.
Afloat to United States.....	695 tons.	247 tons.
Afloat to England.....	50 tons.	50 tons.
Total.....	3751 tons.	2933 tons.

One year ago there were 4228 tons, distributed as follows: United States, 1427 tons; Pará, 955; England, 1296; afloat for the United States, 300; afloat for England, 250 tons. Deliveries during last month were 1465 tons against 846 in April, 1891. Of this the United States consumed 1005 tons last month against 498 in April, 1891, and England consumed 460 tons against 348 in the same time last year.

Receipts at Pará during April were 1025 tons against 1960 tons in April, 1891. The estimated receipts for May are 500 tons, against actual receipts in April, 1891, of 500 tons.

The arrivals at New York during the month have been as follows:

	Pará.	Caucho.
April 22—By the <i>Alliança</i>	365,000 pounds.	49,000 pounds.
April 25—By the <i>Vigilância</i>	26,000 pounds.	
April 29—By the <i>Ambrose</i>	99,000 pounds.	48,000 pounds.
April 29—By the <i>Cyril</i>	433,000 pounds.	90,000 pounds.
May 5—By the <i>Advance</i>	188,000 pounds.	
May 11—By the <i>Maranhense</i>	177,000 pounds.	65,000 pounds.
Total.....	1,288,000 pounds.	252,000 pounds.

The receipts of Centrals in April at New York were 174,000 pounds.

On the ocean is the *Basil* with 280 tons Pará and 20 tons Caucho, and for England one steamer with 140 tons Pará and 30 tons Caucho.

The statistical position of Pará rubber in New York is thus reported for March and April, as compared with the same months in preceding years:

Stock of Pará here	February 29, 1892,	about	1,950,000 pounds.
Receipts	March	"	2,390,000 pounds.
Deliveries	March	"	2,590,000 pounds.
Stock	March 31, 1892,	"	1,750,000 pounds.
Stock	March 31, 1891,	"	2,100,000 pounds.
Stock	March 31, 1890,	"	800,000 pounds.

Prices for March.

	1892.		1891.		1890.	
	Fine.	Coarse.	Fine.	Coarse.	Fine.	Coarse.
First. . .	67	47	87	60	80	60
Highest...	72	52	91	61	85	65
Lowest...	67	47	90	60	80	60
Last.....	71	50½	90	60	84	64

Stock of Pará here	March 31, 1892,	about	1,750,000 pounds.
Receipts	April	"	2,050,000 pounds.
Deliveries	April	"	2,200,000 pounds.
Stock	April 30, 1892,	"	1,500,000 pounds.
Stock	April 30, 1891,	"	3,100,000 pounds.
Stock	April 30, 1890,	"	750,000 pounds.

Prices for April.

	1892.		1891.		1890.	
	Fine.	Coarse.	Fine.	Coarse.	Fine.	Coarse.
First.	71	50	90	60	77	53
Highest....	71	50	90	60	77	54
Lowest....	68	46	87	57½	75½	52
Last.....	68	46	89	59	75½	52

Late cables from Pará quote Islands at 4600 reis, and some business in up-river several days ago at 5100 reis. Receipts at Pará so far this month, 170 tons.

English cables report price Pará at 25. 10d.

The latest New York quotations are:

Pará, fine, new.....	68-69	Sierra Leone.....	25-42
Pará, fine, old.....	71-72	Benguela.....	47-48
Pará, coarse, new.....	46-50	Congo Ball.....	37-48
Pará, coarse, old.....	46-51	Small Ball.....	35-40
Caucho (Peruvian) strip.....	46-47	Flake, Lump and Ord.....	26-27
Caucho (Peruvian) ball.....	50-51	Mozambique, red ball.....	
Mangabeira, sheet.....	40-42	Mozambique, white ball.....	
Esmeralda, sausage.....	50-51	Madagascar, pinky.....	53-55
Guayaquil, strip.....	39-41	Madagascar, black.....	40-42
Nicaragua, serap.....	48-50	Borneo.....	28-43
Nicaragua, sheet.....	44	Gutta-percha, fine grade.....	175
Guatemala, sheet.....	40-44	Gutta-percha, medium.....	115
Thimbles.....	40-41	Gutta-percha, hard white.....	115
Tongues.....	32-38	Gutta-percha, lower sorts.....	nominal

In regard to the financial situation Messrs. Simpson & Beers, brokers in crude India-rubber and commercial paper, New York, report:

"During April time and call money ruled phenomenally low, and the feature as to rubber paper is still its scarcity, there having been an active demand for prime names at 4½ and 5 per cent. four to six months maturity. At this writing our market is about bare of such paper. The prediction is that money will remain abundant until September 1, as the demand for spring business is well-nigh over, and gold exports are not likely to be heavy. Our last bank statement showed some \$20,000,000 in excess of legal requirements."

Boot and shoe factories are generally running full and details which a year ago were slow, are now coming in with considerable freedom. The complaint made is of the low prices. While everyone has enough to do, the general idea seems to be to keep busy, and not risk any chance of idleness by maintaining a firm price. Factories well organized and placed on an economical basis naturally have the advantage, making a profit, where the less-favored neighbor is just keeping above water. The organization of the United States Rubber Co. grew out of this state of affairs. The manufacturers of high grades fare much better than those who rely on "thirds," the discount on that grade of goods being so much as 70 per cent.

Some very fine export orders are being forwarded, and the Mexican trade is mentioned as peculiarly good. The demand from this source is for the most ordinary qualities, nothing better than "thirds" being inquired for.

The great boon to the shoe-manufacturers now is the tennis-goods trade. These are sold at net prices, and the demand remains unabated. It is a harvest for the manufacturers and all that ingenuity, art and skill can do to nurse the trade is being practised by every one in the business. Novelties of all descriptions are eagerly secured, and made up to please the fancy of the wearer. In the use of the tennis-shoe there is something of a revolution. The farmer or the suburban resi-

dent who, a year or two ago, was in the habit of having his pair of carpet slippers, now has his tennis in place of them. His wife and daughters at that time bought them as a fad more than anything else, but the convenience of their use if one wished to step out into the dew for a moment, proved their necessity in time, and the head of the family soon found himself a shrewd follower. The servant at the summer resort has found them to be noiseless and a protection in varied out door duties. Even the sneak thief, or the burglar finds them desirable. In the light of cheapness the now undesirable carpet slipper is expensive, in comparison, so, that economy is an incentive to its use.

These factors in the introduction of the tennis-shoe, are moving with a great sway, and one community after another is taking up its use until the manufacturer and dealer who at first looked upon it as a passing fancy of those who will buy any and every novelty within their means, and the makers who did not think it worth while to throw their forces upon its production when they thought it would be so short-lived, are now bending every effort to get into the swim and obtain their share of a business which at any rate at the moment is more profitable than the old rubber shoe.

In clothing there is little doing. West the weather has been very rainy and undoubtedly has stimulated the demand for light goods, but retailers so far are the only ones in the trade who have reaped any advantage. One or two companies report a good demand for light goods, but all report that the trade for heavy garments is flat. This is natural at this season, but the lack of demand is more pronounced this year than last. The very cheap garments do not sell so well as they did, but there is not much demand for expensive articles. Manufacturers of cloth complain of an indifference on the part of the mackintosh maker, who, while the latter claims that he expects a large business later on, is not willing to forestall the probable demand by present orders.

The cloth man is not willing to embark into the enterprise, which in ordinary times would be a usual one, by making up a stock, and so the whole business from the loom to the retailer's shelf is in as apathetic a state as could well be imagined, from which it will emerge as soon as a wet season happens upon us. Rubber-men say that the climate appears to be changing. Winter does not come until New Year's and then it is mild, and one year after another is a disappointment. After the blizzard of 1888, more rubber goods were sold in a short time than in any whole season since, and the fact is conclusive that it takes an extraordinary event of this sort to make every one happy. Of course more goods are sold than then, but competition grows

faster than the demand, and keeps the trade in an unsatisfactory condition.

The webbing people report a poor business, and low prices, with an advance in the raw material.

There is a good demand for belting and the mills are very busy. There is no stagnation in stocks anywhere, and the trade are in good spirits. The same can be said of packing, the difficulty being that a large volume of cheap goods is pressing upon the market, which keeps down prices for the better qualities. In hose the season opened in excellent shape, and dealers contracted largely, but the weather has been cold and very rainy in the West, and the retailer so far has failed to dispose of his stocks. This is only temporary, however, and with seasonable weather it is believed that the second call will come forward in good shape.

The demand from manufacturers for mechanical goods has been for months larger than for the same time in many years, and transportation companies seem to have greater necessities in this direction than ever before. In air-brake hose there is a large volume moving, all the "granger" and Trunk lines adding largely to their car-equipment as fast as their financial position will permit. The railroads expect a large business now, for surely the next two years, and renewals and new equipments in this direction are expected to be large. The phenomenal demand for bicycle-tires continues, and all reports lead to the opinion that a great many concerns will eventually take up this specialty exclusively.

In jar-rings the demand has slackened; the late season making the extent of the fruit crop an uncertain factor.

In druggists'-sundries the trade is of an average character for the season. Fancy goods are in slight demand. In tourists' and yachting goods there is a good business expected, and dealers are preparing for it. One manufacturer, who, in order to fill in a spare moment for his force took up the manufacture of bathing-caps, is now wondering what he has struck, and when he ever will get a chance to catch up with the orders given him in other lines.

The demand for dress-shields was never better, and in fact any peculiar specialty placed fairly upon the market seems to be a bonanza for the originator. The sheep that go in droves seem in these times to have poor browsing, but the fellow that strays away from the flock finds the field which is green, and has it all to himself. This has gotten to be so true in the rubber business, that the originator of a new article seeks to introduce it quietly so that his competitors may not follow him, and often drops in the opposite error of trying not to do a thing with one hand, while the other is busy doing it.

THE F. J. KALDENBERG CO.

211 to 219 East 33d Street, New York.

MANUFACTURERS OF

Rubber Goods for Mechanical and Manufacturing Purposes

F. J. KALDENBERG, Pres.

F. R. KALDENBERG, Vice-Pres.

EBERHARD FABER, Sec. and Treas.

GONDORIZ ON THE UNITED STATES RUBBER CO.

Pará Correspondence of the "India Rubber World."

THE people of Amazonas have little faith in the new syndicate, known as the United States Rubber Co., of which the flaming prospectus has reached Pará and Manáos by mail, although it seems to be planned on a much grander scale than any of the former American enterprises organized for operation here. Americans who have settled here in the past have had an unfortunate propensity of talking too much in advance of their great intentions, to be followed almost invariably by failure. There have been liquidations by as many as seven large American concerns here within as many years, so that the native merchant does not trouble himself much about the plans of New York capitalists to control the traffic of the Amazon valley. Then the language of the promoters of the new syndicate is in its character offensive to the Brasileiro and antagonizes at the start those whose friendship to the New Jersey corporation might prove helpful.

But it is not practicable for any one firm, particularly of foreigners, to control this trade. The rubber crop is about 18,000 tons a year, the business of one month aggregating 3,000,000 pounds, or not far from \$2,500,000. On the movement of this one product the entire population is dependent. It may not be difficult to buy up all the steamers now plying on the Amazon. The Amazon Steam Navigation Co., Limited, is an English corporation, with headquarters in London, who about a year ago sold their thirty-one steamers, exclusive of tugs, together with all their franchises and uncollected subsidies from the Government of Amazonas of \$250,000, to a Brazilian syndicate at Rio for \$4,300,000. I have official statements showing that the entire value of the company's plant did not exceed \$3,125,000. Well, the "Empresa de Obras Publicas no Brazil" have not been able to make payments as per contract on the purchase of these steamers, and it is within the bounds of possibility that they would not object to entering into negotiations with the United States Rubber Co. for the sale of this enormous plant. There are other steam navigation companies on the Amazon, but this is the most important. However, its plant doubtless could be duplicated by new steamers at half the figures quoted above.

There are other interesting facts in regard to transportation on the Amazon. There are thousands of small sailboats or canoes used to supplement the lack of steam communication on short routes. The Brazilian Government also operates the "Lloyd Brasileiro," which does an important carrying-trade from Manáos, a thousand miles up the Amazon, to all the coast cities of Brazil. Their fleet comprises eight first-class Clyde-built steamers. They get a goodly subsidy from the Brazilian Government on account of which they keep their rates 20 per cent. below that of the English company, which by the way, also receives large "subventions," as the English call their subsidies.

Pará occupies the same position towards the Amazon that New Orleans does to the Ohio and Mississippi valleys. There are 50,000 miles of inland navigation in the Amazon basin, extending to Peru, Venezuela, Ecuador, Colombia and Bolivia. Doesn't it seem a trifle boastful, then, for any one company to talk about controlling all this transportation system from the richly-furnished office of some banking-establishment in New York city? As to the importance of the native business community as an element in the case it is well to remember that, while living under the same equator, the people of Amazonas are not altogether like the savages of the Congo region. On the contrary, a majority of the children of the present generation, who are now the ruling spirits in this country, have been educated abroad, either in Lisbon or Paris, or trained in business houses of England and Germany, and in their cities is to be found a great degree of cultivation and refinement, to say nothing of their being able to hold their own in business transactions. They are slow-going, not always seeming to appreciate their opportunities, but they are not blooming idiots. Neither are they so impecunious that \$50,000,000 of United States capital will cause them to surrender the control of the richest valley on the earth's surface.

If North America really desires more direct reciprocal trade relations with Amazonas they might be secured through the agency of a carefully-managed bank at Pará based on American capital. The value of the business done here monthly is more than \$2,500,000, all through English banking-houses, which make their money on this large exchange. Two-and-a-half millions each month are paid out for the natural products of the Amazon valley, two-thirds of which go to the United States. The rubber-men of the United States pay gold coin through English banks for crude rubber, and the rubber broker here pays the producer in merchandise, making room for a heavy profit, by the way. The business in Exchange is so great that it is said that there is a broker for each firm in trade, the fluctuations in the price of Exchange being something which the uninitiated find it hard to comprehend. Usually when a foreigner's "occupation is gone" as a banker or manager, he does not leave the company which he has so severely condemned, but he becomes a "broker" and continues to live among the same objectionable people.

I have talked with many representatives of the rubber trade here, some of whom have been resident in Pará for a long time. All admit that a consolidation of North American rubber-manufacturers is an important enterprise, and that the amount of capital named will give them great advantages in the market. The Brazilian generally, it may be observed, is pleased with the idea of competition between foreigners. He is shrewd enough to see that the price of rubber may decline, yet in the event of a conflict between capital—in a fight between the dogs from the

outside—he will get the bone. Money that comes here for rubber comes to stay, whatever may be the fate of the contestants for prize of the control of Brazilian trade.

The most thoroughly posted man in the rubber trade here, beyond doubt, is the Baron de Gondoriz, who has become acknowledged on two continents as "the Rubber King." The writer called upon him in his inviting home overlooking the Guajara bay, as the harbor of Pará is called, whence he may, from his easy library-chair, see all the shipping of the port. He is, as INDIA RUBBER WORLD readers know, a native of Portugal, well educated in his own country and broadened by extensive travel and observation. His wife, a daughter of the Baron de Cameta, has also travelled extensively, visiting the United States several times, by the way, and is able to criticise in excellent English the civilization of our own country. A younger brother of the Baron, who resides in his house, was educated at Oxford, in England, and has brought to Brazil a collection of choice books which are preserved in handsome bookcases made in the United States. The furnishing of the house in general is very elegant, including some rare hand-carved pieces brought from India. The Baron is occupied during almost the whole of his time by business affairs, talking courteously but rapidly to whoever may call on matters of importance, in whatever language his visitors may use. His possession of a title does not lead him to put on any airs of superiority. Seated at an American-made desk he conducts his correspondence without the aid of a typewriter.

Just now he is engaged in a legal controversy with some of his fellow-citizens, resulting from the collapse of the recent rubber combination at Pará, of which the Baron was the manager. The general opinion, even among some of those who suffered losses from the collapse, is that the indictment of Gondoriz savored more of persecution than of prosecution. They are, in short, playing the "baby act," and have neither the respect nor the sympathy of the community. It was always right enough for the Brazilian to gather in the foreigner's cash in rubber speculations, but when the native lost in the deal the tables were turned and he became an enemy.

"I venture to say," the Baron said to your correspondent, "that if I had at my disposal \$5,000,000 in hard cash, it would not be a very easy task for the United States Rubber Co. to absolutely control the exportation of crude rubber from Brazil. But this is out of question. Pará receivers will do nothing, and I will be only too glad to leave Pará as soon as possible, without the slightest idea of returning to this city, unless associated with some powerful combination, whose object might be to break the Pará market and do everything to purchase rubber here as cheap as possible.

"You can say for me that I wish the United States Rubber Co. all success, especially if they attempt to ruin the business of the present rubber receivers, with a few exceptions, and that I am quite willing to do everything in my power without the most insignificant remuneration to assist them in this object. But their idea of controlling the means of transportation in the Amazon river, and of gain-

ing the absolute control of the cream of the rubber forests over an area great enough to constitute an empire is puerile and absurd.

"There is in Brazil a sort of thing called Law, which I presume also exists in the United States, and such a thing has something to do with the relations of people among themselves, as for instance regarding the invasion of land. It is utterly ridiculous to believe that rubber lands have no value and are free to any invader, as it is ridiculous to say that the local governments, impecunious as they are, would prefer to pay in grants of rubber lands the subsidies to the steamboat lines.

"I think that if the United States Rubber Co. simply make an advantageous combination with the manufacturers in the United States, the next best thing they have to do is to leave the production of rubber alone, and go on buying the commodity in Pará and Manáos, on the same terms the other purchasers do. It is very easy for such a company to obtain enough control in the consuming markets as to cause a decline of prices when it suits them to stock up in Brazil, and then buy as much as they possibly can, letting the market reassume its natural course as soon as they have so purchased large quantities.

"With a considerable capital it will be very easy for any one to control and bull the rubber market, but it requires a good deal of ability to bear the market—if the Pará and Manáos people should start an opposition to the United States Rubber Co.'s schemes, which at present they would be in a position to do more or less effectively. The biggest talent of Wall street will find himself at sea, if he is transported to Pará where a medium-sized native talent will achieve a good deal more than the brilliant New Yorker.

"It would not be at all impossible for Pará to float a company with \$100,000,000 capital and subscribe \$200,000 and make the American manufacturers pay a pretty big price for the rubber they may need. Fortunately for the American speculators, the Pará rubber-receivers, with a very few exceptions, are almost illiterate and know absolutely nothing about the way in which the rubber business is done abroad. What they know about this business is the difference, when there is one, between the prices offered by two different buyers, and they are smart enough to take the higher price of the two. This embraces all their knowledge about such an important business.

"I have handled the rubber business in Pará for years, and although it is generally and absolutely known both in the United States and in Europe that through my constant efforts in this market since 1879 the Pará rubber crops have been sold to a much better advantage for the receivers and producers, still this is utterly ignored by said receivers, most of them believing that I have had nothing to do with the keeping and advancing of prices in this long period, although I have devoted all my attention and ability to such business all this time.

"This fact is clearly illustrated by the action of some of the stockholders of the Companhia Mercantil do Pará representing, I must say, the meanest characters in the trade, bringing criminal charges against me for facts which oc-

curred during my absence—and which moreover involved in fact no criminality. Then, although possible, I do not think that the American Trust needs to fear the opposition of Pará receivers in the way of a serious organization to counteract their schemes."

Referring to the prospectus of the United States Rubber Co., the Baron says:

"The acquisition of land, besides, is not the only thing necessary to produce rubber. It is also required to have men to tap the trees and these men have to be procured and fed, and all this is done at a certain cost—it being very difficult to prevent such men if they are unscrupulous selling to some one else the rubber they have gathered for their employer from whom they have received an advance for it.

"In my opinion it would be of greater benefit to the Trust, as already expressed, to perfect their arrangements in the United States, and not meddle with lands and navigation in the Amazon river, as the price for the crude rubber in Pará and Manáos is exclusively ruled by the prices in New York, London and Liverpool, as long as there is no strong speculative element in Pará to support this market against the too-apparent manipulations of the parties interested abroad in depressing prices.

"The idea is perfectly correct that the Pará rubber receivers are too far lacking in the appreciation of their resources to protect themselves against the control by speculators of the consuming rubber markets, but this is all to which the aspiration of the United States Rubber Co. must tend to, if they care for success.

"Their efforts must exclusively tend to handle the American and English markets, and have intelligent agents in Pará and Manáos—to whom a certain discretion is given—and let them secure as much cheap rubber as possible during the period of large arrivals. Anything else than this will in my opinion prove disastrous, whatever may be the financial ability of the parties interested and the capital employed.

"THE INDIA RUBBER WORLD says that whoever can control the means of transportation on the river Amazon has the key to the whole situation, compared with which any scheme merely to buy and hold the rubber coming down to Pará as attempted more than once by the "dashing and ambitious Baron de Gondoriz," is puerile and insignificant.

"If I am qualified as dashing and ambitious, simply because I have tried and sometimes succeeded in selling at a profit in the consuming markets, larger or smaller quantities of rubber bought at Pará, what is the adequate qualification to be given the United States Rubber Co., which contemplates the control of the Amazon river navigation, and, it seems, all the Amazon and Pará rubber lands?

"Of course this must seem to be a quite legitimate and conservative business, and the most easy thing in the world to carry through, although I feel perfectly sure that experience will show that it will be simply foolish to attempt such an achievement."

J. ORTON KERBEY.

Pará, Brazil, May 11, 1892.

HOW RAILROAD COMPANIES BUY RUBBER GOODS.

By I. A. Sherman.

RAILROAD-MEN buy large quantities of India-rubber goods. Their trade is worth striving for by manufacturers, but it runs in channels so peculiar that companies seeking for the first time to get a share of it are apt soon to become discouraged and relinquish their efforts. It is not unusual to ascribe such failures to bribery or corruption, involving the railroad purchasing-agents and the fortunate companies enjoying their patronage. While a good fat commission may have been pocketed by a purchasing-agent here and there for supplying his company with a given line of goods, there are other considerations of vastly greater weight in controlling the sale of India-rubber for use on railroads.

The organization of a large railroad embraces a staff of finely-trained men, having more than the usual amount of common-sense, banded together with one object uppermost—the skilful and economical operation of millions of dollars worth of property. Responsibility is ever present, and errors are severely criticised, a few of them proving serious to a reputation, and a tendency in that direction generally followed by a "resignation." Hence the purchasing-agent always looks with suspicion or at least caution on the new-comer with goods to sell. The quality of the latter cannot always be measured at a glance; it

may be learned only by a long and expensive test, ending, in the case of inferiority, in a disastrous accident. Hence the tendency of the agent to confine his purchases to goods with which he is perfectly familiar, and to firms of long-recognized standing.

It does not excuse the purchasing-agent, after a fatal railroad accident, due to the failure of an air-brake on account of a defective length of hose, for him to say that he bought it of a salesman profuse in his claims of superiority, whose prices were so favorable that he thought it well to give the goods "a trial." After such a disaster the purchasing-agent is anxious to come to the front with the prompt assertion that the supplies of the railroad had all been bought from a house standing at the head of its class; that a good price had been paid for them, and that the sudden failure was unaccountable. In the lawsuits that often follow a fatal or serious accident, the railroad lawyers talk eloquently about "due diligence," parade the highly-respectable supply-house before the minds of the twelve men, just and true, and make as much of a bad case as is possible. But if it should leak out that the accident has been due to an experiment in the use of equipment, the result is apt to be serious, exemplary damages often following. Thousands of dollars of the company's

money are at stake—possibly a whole year's dividends—and lessons of this sort do not need to be repeated.

Railroad-men have also been imposed upon by specialties. A glib-talking salesman has often asked that a certain specialty be tried on a railroad, a request that has been granted with the mortifying result that a patentee in the background has mulcted the company in heavy damages for the use of an invention obscurely known before, but well remembered ever afterward. The matter of payments is also a factor to be considered by new firms seeking the patronage of railroad companies. Bills have to be made in duplicate or triplicate, well itemized, on peculiar forms, passing through several departments, for approval, and a hitch in them on account of an informality is annoying and makes a firm unpopular at the start. Railroad officials are busy men, crowded with detail, and they may speak out spitefully when bothered by a want of special knowledge on the part of others. For these and many other reasons the purchasing-agent likes to keep his business in well-beaten lines, departing from them as seldom as possible.

In carrying out the peculiarities of a policy in the purchase of supplies a great trunk-line is liable to be misunderstood and anathematized accordingly. By some by-law of the directors of a great railroad terminating in New York City bids are asked for on all supplies needed by the company, but somehow the same firms always secure the contracts. Other firms believe that by indirect means the firms who are already "in" are informed of the size of competing bids and shape their figures accordingly. It is more probable, however, that the company feels safer in following the beaten track in awarding contracts for supplies. It is not to be concluded, however, that the obstacles in the way of obtaining railroad business are insurmountable, though it does require persistency and patience to overcome them. It may be mentioned that railroad-men understand each other, and some of this class have become salesmen for railroad supplies with excellent results.

Railroad companies vary so in their manner of making purchases that there is no well-defined rule to be followed in dealing with them. The great trunk-lines have each a purchasing-agent established in some metropolitan center. He is a close student of the markets, and possesses a knowledge of details almost infinite. He knows the wants of his road, both present and prospective, keeps the run of its financial condition, calculates its purchases so that the amounts will not be extraordinary in any one month—particularly so that they will be small when the directors are straining a point to close the year with a good showing for the stockholders. He goes slow in hard times, buys little on a falling market, and boldly on a rising one, dines with his supply-man, and wines with a boon companion coming from a rival house—in fact a marvel in his way, whose services bring him an excellent salary. Then come the smaller railroads, which have purchasing-agents located at the metropolis, as busy as bees, making a reputation, and in the meanwhile a closer and more careful bargain than their more favored brother.

Still smaller roads follow, and they are apt to go to the inferior supply-houses. Sometimes purchases are placed in the hands of a superintendent of machinery or rolling-stock, or the man who sports the less dignified title of master-mechanic. These men have not so much time to watch prices and markets, and buy of a house giving them good qualities, fair prices and little trouble. Their ruts are deep, however, and they change from a favored house with reluctance. The greater the influence brought to bear on them to change, the more stubborn they become, and instances are common where it has required the downright mandate of a railroad president for the transfer of custom, and then it has proven only temporary, for a high official likes to fix responsibility and does not rest well with an apparently arbitrary order virtually absolving a subordinate from blame in the case of a disaster. These agents are often good judges of India-rubber goods, and articles which have passed muster at the factory may be rejected by them at sight.

The quality of goods is a paramount consideration. The Pennsylvania Company, it is said, never ask a price until everything else is satisfactory. Then the matter of cost is quickly settled. The New York Central will have nothing but the best, and the Erie, with its struggle for years to better its financial condition, takes nothing but excellent goods. So it is with the Lackawanna, one of the most carefully systemized roads, in its supply department, in the country. The Delaware and Hudson is a slow buyer, but obtains a good article. The New England roads, peculiar and variable in their organizations, are good buyers, with shrewd men in the markets. The Western roads are variable, and it is said of the far Western that they are not careful buyers. An old-timer in railway management claims that a good many of them are run on a temporary basis, or, in railway parlance, are being "skinned," and buy as cheaply as possible and naturally of poor qualities. Southern railroads in the past have not been in nearly so good a financial condition as the Eastern roads, and while they are improving, it is slowly. They have bought poor qualities, or makeshifts, but supply-houses say now that they are taking better goods, realizing true economy. Their equipment as a whole is not of the high and complete order of the Northern railroad, and when one leaves the main lines, the difference is striking. When a road clings to the old iron rail, as will yet be found in that section, it is hardly to be expected that steam-hose, or even air-hose, will be found on that line. The trunk-lines, however, have good buyers in the various markets, and the amounts taken are of large proportions.

A feature of railroad life is that the master-mechanics have at stated intervals conventions in which they discuss subjects of common interest, and it is at these the supply-man gets in his fine work. With a good expense account he swoops down upon the meeting place, and for a few days he is a prince of good fellows, making acquaintances right and left, with blandishments to the new man as peculiar to himself as they are irresistible, and invariably returning home with several good customers in prospect. Nothing like the festal board promotes acquaintanceship.

Railroads take large supplies of rubber belting, favoring that sort for the elevators. This possesses great strength and durability, and retains its shape, varying very slightly in width and thickness from use. The belts do not slip on the pulleys, this giving them a gain in power, and adjustment is seldom required. An essential advantage in railroad work is that belts are not affected by great heat, and in cold weather they remain flexible, and their natural water-proof qualities render them excellent for out-door work, and in wet and damp places. A roll of belting approximates 400 feet in length, is made single to 15-ply and so much as six feet wide. Endless belts are made to order. The business in rubber belting with railroads during the past year has been very large, the grain crops having taxed the capacity of the elevators to the utmost.

Of hose railroads are large buyers for their manifold industries, as in the repair shop a great variety of work is executed. They require at the same time hose for water-tanks, air-brakes, steam-heating, gas-tubing, and other specialties peculiar to the operation of transportation lines. A special sort of water-hose used is for tanks varying from three to ten inches in internal diameter. All sorts of hand hose are needed for one purpose or another, some oil-hose and generally a good quantity of fire-hose, for railways provided against conflagration. In fact it would be unwise to rely on the village fire-departments in some of the localities where they have large shops. A great deal of gas-tubing is now being sold to railroads as there is a tendency to the lighting of cars by gas, the oil lamp gradually disappearing. This is a nicely manufactured article, as gas will find a defect in short order. It is made in five- and six-ply, sometimes canvas covered, is five-eighths of an inch in diameter and for the best qualities \$1 a foot is paid. Signal hose is also being used to a great extent, the science of pneumatics being more practical for inter-train communication than the clumsy bell-cord, or the electrical devices which have just gasped for this purpose. This comes in two-foot lengths, has an external diameter of $1\frac{1}{8}$ inches, molded, with capped ends.

It is, however, in air-brake and steam-heating hose that railroads make large purchases, and in the past year events have transpired to increase the demand. The car-stove is now most decidedly a "back number," public opinion demanding its disuse. Railroad-men are finding that air-brakes on freight trains are of decided advantage, increasing the capacity of their rolling-stock. In the air-brake which is now also used for signal purposes a hose is made in fifty-foot lengths, one or $1\frac{1}{4}$ inches in its internal diameter, of excellent material and sold at from 80 to \$1.05 per foot. It is generally made in four-ply. In steam-heating hose great care is used in manufacture. An ordinary vulcanization of rubber is 250° and the pressure of steam if allowed to go over forty pounds will give a temperature greater than that causing the rubber to harden and impairing gradually the efficiency of the hose. The pressure ought to be kept as low as practicable, fifteen to twenty pounds being considered the best for the long life of the hose. Pure rubber requires a high degree of heat in vulcanization, so the master-mechanic feels safer when

he knows the quality of the goods he is purchasing. The smaller the diameter the less the strain, for while a half-inch eight-ply hose will stand a pressure of 200 pounds, a $2\frac{1}{4}$ -inch hose will only admit of forty pounds. Each ply admits of about $33\frac{1}{3}$ per cent. more pressure. The sizes and prices and forms and qualities of steam-hose are practically beyond enumeration in the present article. The rubber is combined often with linen or cotton, and woven or knit, and again is sometimes made in a seamless form.

Railroads use a great deal of packing for steam-air- or water-joints, and rubber more than any other substance has elasticity and is capable of standing great heat. It has a cloth insertion, varies in thickness from $\frac{1}{4}$ to $\frac{1}{2}$ inch, and comes in rolls one yard wide and twenty yards long. A pure gum packing is made in widths of about forty inches. Again, a superior quality is made with wire, and a still better with duck insertion, and there is a description which vulcanizes with use, making a superior article. A square pump piston packing is made of fine cotton duck and Pará rubber, and is especially intended for packing piston rods and valve stems. Gaskets and rings are plain, mixed, or pure, varying from $\frac{1}{8}$ to $\frac{3}{8}$ inches in thickness generally, but departing therefrom oftentimes. Prices are \$1.50 per pound and less, according to thickness and quality.

Valves are used in pumps, and are hard, medium or soft according to the various purposes for which they may be intended. Railroad-men some years ago used a great many car-springs. One of the companies made a very good article for which it charged \$1.30 per pound, but through competition this price was gradually reduced to 35 cents per pound, and it was a reasonable factor in the situation that less and less rubber was used. The railroad-men hardly knew what was the matter, but unexpectedly went over to the steel spring in disgust, and the trade dwindled into very small proportions and never has been resurrected. Street railroads are now good customers for car-springs, and what there is of the business is in the main supported by them.

Rubber diaphragms are used in boilers and vacuum-brakes, and are nearly a foot in diameter. In matting there is an immense quantity sold, the Pullman people using it in every conceivable place. It is made in all forms, perforated, corrugated or in ornamental design. A rubber mat is seen everywhere—in the president's office and the toilet-room, on the car-step in the way of a tread and again forming a resting place for the cuspidore—in fact one can hardly step after leaving the street to the other street at destination without feeling the slightly yielding surface under him. Clean and durable, it has driven every other mat into disuse, and is really a monument to the practical ideas of the rubber-men.

PUZZLING problems are continually besetting rubber-men. Many of them cost a deal of money to solve, and very many would not need careful experiment if there were a thorough knowledge of the principles of chemistry at the command of the seeker after truth. In short there should be no rubber-mill without its consulting chemist.

THE CHEMISTRY OF RUBBER INGREDIENTS AND ADULTERANTS.

By Henry J. Williams, Chemist.*

IV.—SULPHUR.

SULPHUR occupies by far the most important place among the many mineral substances used in making nearly all classes of rubber goods. It is, in fact, the one ingredient always employed, even in such articles as are designated by the name "pure gum," for upon its use in vulcanization depends the preservation of all the best qualities of the India-rubber and the increase of some of its most valuable properties. For instance, vulcanized rubber, when properly prepared, shows a far more permanent elasticity than is to be found in the pure gum itself, while its power of resistance to the action of the atmosphere is largely increased, as well as its durability and wearing quality.

With few exceptions nearly all other mineral substances which are added to the gum, in order to prepare the various kinds of rubber goods, undergo no chemical change whatever during the compounding and curing, but serve rather more as diluents, to add bulk to the rubber, or to increase its stiffness and resisting quality with corresponding reduction of its elasticity, not so much with the idea of taking anything from the quality of the goods as to bring their cost or selling price within the reach of every one. Here, therefore, the compounding consists of a mere mechanical incorporation, the ingredients forming merely a mechanical mixture with the gum. With some few substances, however, such as the various lead salts or with zinc oxide, there may occur during the vulcanization a chemical union between these substances and the added sulphur with formation of sulphide of lead or zinc.

The formation of new chemical compounds being always accompanied by an assumption of new properties which, in many cases, are plainly perceptible to the eye, it may be noted that in the above cases these new properties are made evident by the marked change of color, the lead salts yielding black rubber and the zinc salts an opaque white.

Sulphur combines the properties of both of these classes of mineral substances, for, in the first place, a small quantity of it unites chemically with the gum, during the process of vulcanization, forming chemical compounds with it, which possess entirely new and different properties from those exhibited by the gum itself, while, in the second place, any excess of sulphur present merely fuses with these new compounds and becomes very intimately mixed with them. The finished product assumes, to be sure, the hardness of horn, but this is due to the combined properties of vulcanized rubber, which is tough, and of melted sulphur, which is hard, the mixture, however, being entirely a mechanical or physical incorporation, and the sulphur being capable of separation and removal from such hard rubber by treatment with alkalis.

Sulphur, therefore, can impart to the gum a much wider range of different properties, at the control of the manufacturer, than any other mineral ingredient ever employed, from that of the most elastic gum to that of the hardest horn, according to the quantity that has been used. Sulphur being then of the utmost importance to the rubber manufacturer it may be interesting to note where it comes from, how it is extracted, and how brought upon the market in its present form.

Sulphur is a yellow solid, in commerce called brimstone, from the Anglo-Saxon word "bryne," a burning fire. It was long supposed to be the active principle of fire, an opinion which in certain quarters still prevails, and alchemists supposed that all combustible substances contained it. It occurs in nature in direct chemical combination with many metals, in the form of sulphides, namely in iron pyrites, in copper pyrites, sometimes called "fool's gold," in zinc blende, and in galena, the sulphide of lead, etc.; but it also occurs native in the form of pure sulphur. All of the mineral sulphates, such as gypsum, heavy spar, strontianite, (sulphates of lime, baryta and strontium) as well as sulphates of magnesia and sodium (Epsom and Glauber's salts) contain it in large quantities, but from these it is rarely recovered as such owing to the expense and trouble involved. Sulphur also occurs as a by-product of many manufacturing operations, but in most cases its recovery is neglected.

The recovery of sulphur from alkali waste, however, in the manufacture of soda by Leblanc's process, according to the methods of Schaffner, Mond and that of Messrs. Buquet, P. W. Hoffman and Kopp, is carried out on such an enormous scale that a word of mention is due. Here the abundant residues from the lixiviation or washing of the crude black ash, out of which the soda has been dissolved, contain a very large amount of sulphur in the form of complex sulphides of lime. From these the mineral is recovered by treatment with hydrochloric acid or with the waste liquors from the manufacture of chlorine. It is obtained in a very finely divided form, as a milky precipitate, together with calcium chloride in solution. Upon evaporation the concentrated calcium chloride finally becomes hot enough to melt the sulphur, which can then be drawn off in a liquid form from the bottom of the tank. That the quantities of sulphur recovered in this way are not small may be inferred from the fact, that one company alone, the Austrian Association for Chemical and Metallurgical Products, under the management of M. Schaffner, at Aussig, produces annually some 900,000 pounds of sulphur, in this manner.

Aside from all these minor sources, the great bulk of the sulphur of commerce occurs in volcanic rocks and nearly all of it comes from Italy, where it is found in the Romagna, and in other parts of the continent, but especi-

* Member British Society of Chemical Industry; Deut. Chem. Gesell., and Am. Institute of Mining Engineers.

ally in very large quantities in the volcanic districts of the island of Sicily. Here it occurs in wide-spread masses, found chiefly on the south of the Madonia range and stretching over the whole of the provinces of Caltanissetta and Girgenti, and over a portion of Catania. No fewer than 275 distinct sulphur workings exist in Sicily, from which the annual production amounts to about 500,000,000 pounds. The rest of Italy has, of late years, contributed some 300,000,000 pounds more.

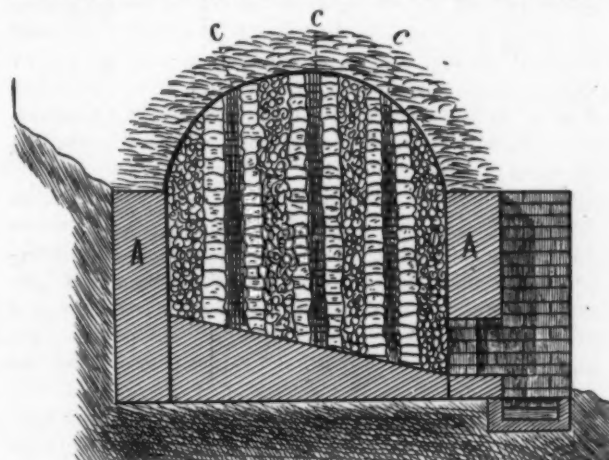
The deposits of Sicilian sulphur occur in marl, limestone, gypsum and celestine, all rocks of the tertiary period. The sulphur occurs partly in transparent yellow crystals termed *virgin sulphur*, and partly in opaque crystalline masses, to which the name of *volcanic sulphur* is given. Both of these varieties are separated from their matrix by a simple process of fusion. Where the ore is very rich this is quite a simple matter, for the ore is simply melted in a cast-iron kettle heated by a gentle fire. During this melting the mass is continually stirred with an iron rod and as soon as the sulphur has become quite fluid the gangue and small stones are allowed to settle and are then removed by means of an iron ladle. This done, the sulphur is poured into a wooden or sheet-iron vessel which has been thoroughly moistened to prevent the adhesion of the substance to its walls. The sulphur when cold and solid is broken into large lumps and packed in casks, ready for the market. The stones and gangue are saved and the sulphur which clings to them is extracted later in a kiln or shaft furnace.

The old system of recovering sulphur from the less rich ores consisted originally in building the ore into heaps within a hole in the ground two feet deep. These heaps were from six to nine feet wide and a small trough was made around them. They were set on fire from the top at night and more than two-thirds of the sulphur was consumed while the country around was poisoned for miles by the sulphurous acid fumes. The next day a portion of the sulphur would be found melted out in the trough. This rough and wasteful process has been improved recently by increasing the quantity of sulphur ore burnt at a time, while the excavation is made about 30 to 35 feet in diameter and 8 or 10 feet deep. These huge kilns are called "calcaroni" and they present about the appearance in the figure shown on this page.

The structure is erected on a hillside and is made circular in form. A wall of brick or stone, *A A*, is first built around the excavation, which has a sloping floor of stone; at one side a low fireplace is provided below and at the side of which there is a trough to receive the melted sulphur. The kiln is charged by first building up hollow columns, which serve as chimneys, *c c c*, for the draft, out of pretty rich sulphur blocks. Around these the small pieces of ore are piled in tightly until the structure is full. Above the whole mass is placed a covering of fine dust, consisting usually of exhausted ore. Fire is applied at the bottom of the pile and the amount of air being limited the temperature gradually increases within while the sulphur pours in a melted state along the sloping floor into the trough at the side of the kiln. The melted sulphur is then

cast in the form of truncated pyramids in poplar molds moistened with water. The calcaroni vary greatly in size; some have a capacity of only 1000 cubic feet and are run at all times during the year, while others may contain over 65,000 cubic feet of ore and run only once a year. In such cases the burning lasts during eighty or ninety days with an allowance of a month more for cooling down. In such a calcarone, therefore, the product of a whole year is burnt at one operation. In some districts, owing to the destructive action of sulphurous acid vapors upon vegetation, the burning is only permitted between the 1st of August and 31st of December, that is between the times of harvesting and sowing. On the average it takes seven pounds of mineral to produce one pound of sulphur and a full-sized calcarone will produce a great many tons of sulphur.

Of course there is a large consumption of sulphur during this process which burns and is lost, but sulphur is the cheapest fuel available in Sicily, and as it is, some 75 per cent. of the amount contained in the ore is recovered. So that crude as this process is it still remains one of the



A SULPHUR KILN.

most economical in operation at the present time, it being possible to obtain the crude sulphur for 1½ cents per pound. The best scientific method for obtaining sulphur would be to distill it from iron retorts, but this does not pay in Sicily.

Sulphur is also obtained in small quantity by distillation from iron pyrites contained in fire-clay or porcelain retorts, but the amount so obtained is very small. By whatever method the crude sulphur is obtained it generally requires to be purified. The purification is effected by distillation from iron retorts. These have a variety of forms. They are generally arranged in such a way that a charge of sulphur, melted by the waste heat, can be run into the retort which is heated and then distills its contents into a large brick chamber. The vapors coming in contact with the cold brick walls condense and fall in the form of light flocks which form the flowers of sulphur of commerce. These can be raked out by themselves. Pretty soon the brick walls become hot enough to melt the sulphur as it comes over and a layer of the melted liquid collects at the

bottom of the chamber and is cast into sticks which come into the market under the name of roll brimstone.

The "block sulphur" of trade is far from pure but it serves for the manufacture of roll brimstone, which is the purest form on the market. Flowers of sulphur, which are so extensively used in rubber, are far from being pure sulphur. They usually contain more or less sulphurous acid which is not combined but merely mechanically held in contact. This can usually be removed by washing with water and carefully drying, and gives a product called washed flowers of sulphur. The drying must be done very completely, however, for if not the flowers of sulphur will be the worse for the treatment. For this reason, too, flowers of sulphur which are kept in a barrel in the factory should always be well covered to keep away moisture, otherwise there may form more or less sulphurous and sulphuric acids in the sulphur which cannot but injure the rubber with which such sulphur is compounded. Finely-ground roll brimstone sifted through very fine bolting cloth has been successfully used in France and found to answer quite as well as flowers of sulphur. Owing to the greater purity of roll brimstone there seems to be no reason why it should not thus be used in preference to them. Sulphur is rarely, if ever, adulterated, but an idea of its quality, as far as mineral impurities are concerned, can be reached by igniting a weighed portion of it in a porcelain crucible and weighing the residue. Only a fraction of 1 per cent. of residue should be found.

The amount of brimstone produced by American mines during the year 1891 was only 2,400,000 pounds, worth \$36,000, and all coming from the Cove Creek mines, twenty-two miles from Beaver, Utah. The total imports from Sicily into the United States amounted, during the year 1891, to 293,632,640 pounds of crude sulphur, 405,484 pounds of flowers of sulphur, and 23,139 pounds of refined sulphur, representing a total value of \$2,152,919. The price of brimstone in New York during the year 1891 ranged, on the average, between \$29.83 and \$32.21 per ton of 2000 pounds.

It may be said truly that were it not for the existence of sulphur in the world, no chemical or manufacturing processes involving the use of chemicals could exist, for it serves for the manufacture of sulphuric acid upon which the manufacture of almost every other chemical in use depends, directly or indirectly.

Quality of Rubber Jar-Rings.

ACCORDING to Reuss, in the German *Chemical Zeitung*, rubber jar-rings used in preserving fruit contain lead and are therefore injurious and even dangerous. While the assertion of the eminent chemist cannot be ignored, it is still a question whether his conclusions are not somewhat strained. In any event the use of the cheap jar-ring is not so much a matter of choice on the part of the rubber-manufacturer as it is the cupidity of the jar-maker, who is ever on the lookout to obtain the lowest possible cost for everything which goes to make up the article he vends. When the jar-ring was first introduced the price of them

was about \$1.50 per pound, and they could be well made of pure rubber at that price. Now rings called "pure" are sold at about 50 cents, and with the price of rubber at 75 cents per pound it does not take much of a mathematician to calculate the purity of the article. Again, in the composition article the price at first was about 95 cents; now one of the largest concerns in the country makes its contracts for jar-rings at 21 cents. In the competition which naturally follows in the sale of jar-rings there is a great temptation—in fact it would seem imperative to the manufacturer who wishes to remain in the business—to load his product down with lead, or other substances. Should he charge cost for the pure article, not to say anything about profit, he certainly would not obtain any orders. The preserve-dealer makes very little, however, out of the use of the cheap jar-ring, for it weighs nearly twice as much as the pure article—a fact so plain to the thinking mind that it is hard to understand why it is not recognized in the trade.

It is only fair to state that the fruit-jar men claim that the preserves in the best glasses do not touch the ring and so the use of it is not deleterious. It is only in inferior packing that the contact takes place, and then the question comes up whether there is enough lead in the compound to cause anything like serious results. There is a point in these matters where they naturally right themselves. The car-spring, for instance, was forced down so low by competition that it became worthless for the use for which it was intended and the steel spring drove it out of the market. The use of rubber in the jar-ring is not imperative, a point that the present peculiar demand is in a fair way to prove when present compositions are analyzed.

The trade in jar-rings this season bids fair to prove a large one. Last season the fruit crops were so large that it was impossible to obtain sufficient rings for the trade, and as one extreme follows another, everyone this year is forestalling his needs in an extravagant manner. It is no uncommon thing for the small dealer to have orders on his books for two and three hundred barrels and the larger concerns do what can be considered an immense trade. If made of pure rubber there are about 175 rings to the pound, but the compounds reduce this number very much and make it very variable according to the ingredients.

Tests of Rubber Belting.

THE tests made recently by the Cleveland Rubber Co., with regard to the best sorts of hose for particular purposes, resulted as follows:

Where a pressure of 25 pounds or less is used four-ply should be ordered for 1½-inch and smaller sizes, and five-ply for 1½-inch and larger sizes.

Where a pressure of 60 pounds or less is required five-ply should be ordered for 1½-inch and smaller sizes, and six-ply for 1½-inch and larger sizes.

Where the pressure exceeds 60 pounds, add one ply for each additional 10 pounds of steam. Where 90 pounds or more pressure is required the hose should be duck-covered and wire-bound.

TOPICS FOR RUBBER-MANUFACTURERS.

ALUMINUM FOR HOSE-COUPPLINGS.

ALUMINUM was scarcely known outside of the laboratory twenty years ago and the processes for making it were so expensive that no one thought of using it except as a precious metal. At that time it was worth \$20 per pound, and was scarce even at that price. Improved methods of manufacturing it, however, have been instrumental in reducing its price to a very small fraction of what it was at its introduction, and it is now possible to obtain it in almost any desired quantity. At first there were glowing predictions of the extent of its use and that it would replace iron, steel, brass and bronze in a multitude of ways, but these imaginative ideas gave way to sober second thoughts as the properties of the metal became better known, and it has won a channel peculiarly its own in the economy of the industrial world.

Aluminum commercially pure, as it is commonly obtained, is a rather soft metal with a tensile strength of between 24,000 and 25,000 pounds to the square inch, and it also has a very considerable amount of ductility. For this reason the metal is used in a pure state only on sheet-metal where it is to be stamped or spun; or where it is to be used in connection with other metals to be amalgamated or mixed with them. In experiments it has been found that a mixture varying from 2 to 5 per cent. of copper makes an excellent alloy, stronger than pure aluminum, and quite as good as brass, and as the small percentage of copper used does not add materially to the weight it is not strange that it is very desirable wherever lightness in weight is a factor, such as in many forms of castings. Such castings are now worth about \$1.50 per pound, and as aluminum weighs only three-tenths as much as brass, so in comparison with brass castings it may be calculated that the aluminum compound will practically cost about 45 cents per pound. Brass castings are worth only half of this price, so it will be seen that its use is hardly practical in displacing all sorts of work, but where this difference in price is counterbalanced by other considerations, implying a reduction in weight to overcome inertia in machinery or the lifting of bodies by hand, it is then that aluminum comes to the front.

One of the broad fields in the future for this metal is that of appliances for fire departments in cities and towns. The paraphernalia of the fire department, as perfect as it seems to be, is heavy almost to unwieldiness, and as with the exception of the pumping and forcing of water, everything necessarily has to be done by human or animal power, and done quickly, the use of this metal as strong as brass must enter largely into the makeup of engines, towers, hooks, ladder joints, and most certainly into hose nozzles and couplings. The hoseman who has to mount a ladder carrying a heavy length of hose into all sorts of dangerous places is the very last person who should be hampered by an extra ounce of weight and it is in this way that the new metal will appeal in a very practical way to the

common sense of those having such matters in charge. At present the hoseman carries a nozzle with him into the burning house, science and economy in weight having reduced this to the smallest proportions so that it now only weighs three pounds, but aluminum would reduce this still further to nine-tenths of a pound.

The couplings are made of brass, and have to resist the pressure of loaded teams passing over them, and such rough wear and tear usual to handling in times of emergency. Some doubt has been raised as to the possibility of cutting a thread in aluminum so that it will not be abraded, but engineers give it as their opinion that with aluminum bronze this could readily be done.

In water-towers, brass work on hose-carriages, engines, and so on the advantage is great and hardly necessary to discuss. When rubber companies spend years in reducing the weight of their hose from 75 to 45 pounds for a fifty-foot length it seems that the saving by using bronze aluminum castings is one that can hardly be overlooked, as another step to lighten the labors of those to whom we look in moments of dire necessity.

One of the best authorities on aluminum in this country, Prof. Joseph W. Richards of Lehigh University, author of the leading work on aluminum, writes:

TO THE EDITOR OF THE INDIA RUBBER WORLD: Aluminum hardened with copper or titanium, so as to stand threading and the wear of screwing and unscrewing, would be a perfectly practicable material for hose-couplings, and would be unaffected by any amount of pure water, in any length of time. I have never given this matter any special thought, so am unable to write any article on the subject. Sincerely yours,
JOSEPH W. RICHARDS.

Bethlehem, Pa.

MANUFACTURE OF RUBBER CEMENTS.

RECIPES for making India-rubber and Gutta-percha cements are exceedingly plentiful and, to be frank, usually worthless. This is because the men who write the recipes rarely make the cements and therefore have no practical knowledge to bestow. There are three distinct classes engaged in the manufacture of cements in this country.

First are the rubber-manufacturers. As nearly all use large quantities in their making-up process, they as a matter of course make their own cements. The shoe-men, for example, have what is known as yellow cement, which is made of carefully massed fine Pará rubber, mixed with a little litharge and containing enough sulphur to effect vulcanization. Some use a little powdered rosin in this compound and others do not. A good cement may result in either case. Naphtha is the solvent commonly employed, although a specially-prepared turpentine is said to give excellent results. Upon this cement devolves the duty of binding together the separate parts of the boot or shoe, and it is usually so well made that it will outlast all the rest of the rubber portions in footwear.

The mechanical-goods and druggist's-sundries manufacturers usually make cements for special work by simply taking some of the uncured stock of which the goods are to be made and dissolving it in benzine. The clothing men make a cement that is almost exactly what the boot-and-shoe men use.

The second class of cement-makers are those who make and sell it by the barrel to leather-shoe manufacturers. These men usually have small plants and devote themselves to the making of cement and nothing else. When they use Pará rubber they do not wash or mass it, but slip the hams apart, leaving two grades of rubber, the dark outer covering and the light insides. After separating, these are soaked in naphtha until a swollen pasty mass is the result, and then it is put into a digester and mixed until homogeneous. A little rosin is sometimes added, and frequently a little shellac. When other grades of rubber are used than Pará washing is necessary, but no massing is done, as curiously enough that seems to interfere with the making of a bulky tenacious cement. There are about fifteen small factories devoted to the cement business, and they sell many thousands of barrels yearly.

The third class of cement-manufacturers is insignificant. They are the makers who sell bottled and canned goods. They have a small laboratory where India-rubber or Gutta-percha is dissolved in bi-sulphate of carbon, chloroform, ether or benzene. They have secrets that were old when the walls of Sodom were laid in "pitch." They use asphalt, shellac, rosin, pitch and sometimes buy a straight cement from a rubber mill, and putting a fancy name on it deal it out in dribblets to small consumers. This is about all there is to the mysteriously secret business of cement making.

VERMILION IN RUBBER-MANUFACTURE.

THERE are few persons in this country who thoroughly understand the mode of coloring rubber in its various phases, and this art is a carefully-guarded secret. For dental purposes vermilion is used, and under the skillful hands of the compounder almost any shade may be obtained. To put in the right quantity as well as to manipulate it carefully is the secret, and when the proportions vary from one to twenty-five parts out of a hundred the difficulty becomes apparent. The Chinese vermilion is the best known, but unfortunately when exposed to the sunlight it becomes black in time, and is therefore impracticable for most uses. Rubber-men use the English, which, although inferior in other respects, is not subject to this disqualification.

It is the red sulphide of mercury, or the metal cinnabar, occurring in nature of a red-brown to a carmine-red color. It is most easily prepared by subliming an intimate mixture of six parts of mercury and one part of sulphur, reducing the resulting cinnabar to a fine powder, the beauty of the tint depending upon the extent of the division. It will resist strong alkalis and all acids save nitro muriatic. It is a valuable pigment but few manufacturers can use it so as to get the desired shade and also not overload the rubber. Indian-red is also used to a great extent and

is well liked by the compounder. It is prepared from anhydrous peroxide of iron, and is generally prepared from green vitriol, which is an impure proto sulphate of iron heated in a retort which forms a white powder. The temperature is then raised for several hours until it is free from acid, when it is allowed to cool, and ground into a fine red powder. Salt and nitre are used with the vitriol, but it is difficult for the unskilled to get the proper shade, which is the result of varying factors not readily explained.

Experiments have been made with cochineal for coloring purposes, and although the incorporation is readily performed, the color is not lasting, changing to a dirty purple in a short time. It is consequently little used. Even in lampblack there is skill needed to make a fast color, and the importance of these men in this business is noted by the fact that invariably until quite recently it was the custom to bring up young men generally well related to the proprietors as apprentices who studied this branch of the business as well as the other parts, and took the place of the elder men in course of time. The trouble has been, however, that the boy branched out for himself, really getting tired of waiting for the shoes of those above him, and then the process had to be renewed, and this accounts for the few men in the business who understand the art.

STOPPING HOLES IN RUBBER GOODS.

An invention has been patented in England for stopping holes in India-rubber goods and other articles, which is described as follows by the inventor, Thomas Beaven Sloper, in the official specification, copied into the pages of our English contemporary:

"This invention relates to improved means of stopping or repairing holes in articles of India-rubber and other materials, and more particularly to articles which cannot be conveniently repaired from the inside, such as pneumatic tires of cycles, water-beds and the like.

"In carrying out my invention, I employ plugs or disks, preferably of India-rubber, having a stem or branch from the center. These plugs may be made in a form resembling a mushroom, and may have threads or fibers extending from and passing up the stem into the substance of the disc.

"To repair a hole in the tube of a pneumatic tire I should, if necessary, enlarge the hole to a little less than the size of the stem of the plug, and by means of a scraper, of a convenient form, clean the surface of the rubber inside the hole. I should then take a suitable size plug and insert it, together with a little India-rubber solution, into a thin tube or holder.

"This tube may be of any suitable material, such as steel or brass, and its use is to temporarily compress or reduce the diameter of the plug, and so to facilitate its introduction through the hole which it is to close.

"After inserting the tube and plug through the hole, I force the plug out of the tube, either by means of an air-pump attached to the other end of the tube, or by any other means.

"The plug being now inside the hole and free from the tube, it expands to its original form, and when the tube

is withdrawn it may be pulled into position by means of the cord extending from the stem.

"When the plug is drawn or pressed into position, the tire may be expanded in the usual manner by means of the air-pump, which will cause the plug to retain its position, and, if desired, the projecting stem may be cut off, or it may be divided and cemented to the outside.

"The plugs may be made of any suitable form or size, and, if desired, they may be drawn over the outside of a small tube or other device by a ring, jaws, or equivalent means, instead of being inserted inside a tube to reduce their diameter.

"In order to facilitate the insertion of the tube or plug, I sometimes use a guide or device to temporarily expand the hole. This may be either separate or may be made to slide on the tube.

"It will be obvious that, in the case of a large hole, it may not be necessary to use any other means to assist the insertion of the plug than to roll or tie up the disk, allowing the stem or thread to project.

"Sometimes I make the plug with two discs, connected together by the stem, and spaced apart about the thickness of the substance to be repaired, one disk to be each side of the material."

INDIA-RUBBER IN CHEWING-GUM.

A GREAT many false statements have been made as to the composition of ordinary chewing-gum. Of course where spruce-gum is used, every one knows what the basis of it is, and the article is sold to-day pure and in good quality at from \$.50 to \$1.50 per pound. Most of this gum is gathered in the Green Mountain regions of Vermont, and is sold through the West, as other kinds are more popular on the Atlantic sea-board. The gum, however, that is sold from candy-stands and in drug-stores to-day, is of totally different origin and as a rule it is a manufactured product. To a certain extent this is a secret, as all India-rubber compounds are secret to ordinary observers. What is known as Yucatan gum is made of gum chicle, sugar and a variety of flavors, with certain ingredients which are kept secret, but help to make a homogeneous mass. The flavors that are used are peppermint, wintergreen, licorice, pineapple, and some few medicinal ingredients. Experts in chewing-gum manufacture can tell in a minute whether good flavors are used, whether the best gum is incorporated, and just what the quality of the compound is, but in order to tell this accurately they are obliged to test it by chewing. The gum has a certain quality of sugar added to it to sweeten and make it palatable. It will be noticed that in chewing-gum, after it has been in the mouth awhile, the sugar and flavor is entirely gone, and what remains is the rubber-like product which is the chicle gum nearly pure. This gum is the sap of a Mexican tree which is called sapodilla. It grows in other countries besides Mexico, but that is the only country where a business is made of tapping it. It is collected like India-rubber sap, by cutting incisions in the bark, between the months of November and April, and after the gum has been gathered, it is packed in sacks, 200 pounds to the sack. It is

then a light-colored mass that appears to be about half way between Gutta-percha and India-rubber. In the factories it is washed, dried and mixed much as India-rubber is, only it needs no process of vulcanization, and when run off on the spreaders is cut into sticks, wrapped and packed ready for shipment. Within a few years the industry has assumed large proportions and the demand for it seems to be growing every day. This is the only part of the rubber business that seems to have no dull season, as one part of the year is just as good as another and chewers want their gum in winter as well as summer. It is a mistake to think that only-shop-girls and ignorant people chew gum, as the habit has invaded all classes of society and many physicians recommend it highly. Tobacco-chewers who are trying to give up their habit often take to chewing gum and find it of help to them. It is a curious fact that in England they do not chew gum but rather look down upon the habit as being vulgar, and of the small quantities that have been shipped abroad, but little has been sold. The time doubtless will come, however, when this democratic habit will overcome the prejudices of our cousins across the water, and when the Prince of Wales will be seen with a quid of American gum in his mouth, chewing it with as much gusto as a Bowery boy. Already Australia has thrown up her hands, and decided that gum is a necessity, and American manufacturers are working that market for all it is worth.

IRON RUBBER-SHOE LASTS ABROAD.

THE letters appended which are self-explanatory, were received by a correspondent of THE INDIA RUBBER WORLD who wrote to two of the largest rubber-shoe manufacturers in Europe in relation to their use of iron lasts:

DEAR SIR: We are this morning favored with yours of the 5th inst. We regret that we are unable to give you any information regarding boot lasts made of cast iron, for we have not used them. We have, however, used iron lasts for shoes for many years. The shoe-lasts are very considerably heavier than the corresponding wooden ones, and we would have expected the iron boot lasts to be considerably heavier than the wooden lasts also. We are pleased to hear that they can be produced at practically the same weight. Yours truly,

NORTH BRITISH RUBBER CO., LIMITED.

Edinburgh, December 19, 1891.

DEAR SIR: Replying to your favor of the 4th inst., we beg to state that we do use exclusively iron lasts for rubber shoes, made of common gray iron castings, as we do not get here such from malleable. The average weight of a pair of—

Men's size 8 is about.....	8.7 pounds.
Women's size 5 is about.....	9 pounds.
Misses' size 13 is about.....	5.5 pounds.

The price is about \$6.90 per hundred pounds.

The principal advantage of iron over wood is that it does not change its dimensions, while there is much shrinkage in wood, as well as breakage, but there are often claims of iron lasts being too heavy. For rubber boots we are using wooden trees, as our production in boots is but a small one. Yours truly,

RUSSIAN-AMERICAN INDIA-RUBBER CO.

St. Petersburg, December 24, 1891.

A Change in Methods of Distribution.

A CHANGE has been noticeable within the past three or four years in the manner of the distribution of rubber goods. The small retail rubber dealer, in business exclusively as such, seems to be slowly relinquishing his hold, and the reasons therefor given by the manufacturers seem to be logical. To begin, certain natural channels are being worn for the different manufactures of rubber. Rubber enters into a surprisingly large number of articles, and it would be strange if the general store could in any way keep them all. The boot-and-shoe retail dealer does not pretend to keep all kinds of leather goods; neither does the dealer in agricultural implements pretend to handle furniture, although wood is a chief factor in both classes of goods. So in rubber goods, if an atomizer should be desired, the customer naturally seeks the druggist; if a shoe is needed the boot-and-shoe man gets the trade, and so on.

The rubber dealer has held on rather tenaciously to belting, packing and hose, but recently this trade has begun to depart from him, though much of this is due to the fault of the dealer himself. The rubber dealer, anxious to increase his profits, or maintain his record in that direction, seeks cheaper goods, which he imposes upon the public, who as a rule only ascertain the inferior quality after a season's use, with the result that they simply change their custom. In so doing they have in course of time come to deal with the manufacturer direct, with whom a better knowledge of qualities is acquired and a large proportion of the profits of the middle-man is avoided. Manufacturers, noting this change in the distribution of their products, have been led to adopt their own way, which is to locate branch stores in the larger cities for the sale of goods.

The Pennsylvania Railroad Co., buy, it is estimated, \$100,000 worth of mechanical rubber goods in the course of a year, and it would hardly do to trust the securing of this custom to the perennial visits of the traveling salesman. The consequence is that large branches or agencies are necessary in Philadelphia. What is true of this road is a fact with the other larger roads. Their trade is valuable to secure and can only be kept by giving qualities that are durable. These points, it seems, cannot always be entrusted to the small local dealer, whose desire for immediate gain often gets the better of his judgment. Railroads are larger purchasers of goods probably than any other customers, and steamship lines follow next. Mining industries probably come next, and all these lines are dealing more and more with the manufacturer direct.

Outside of these, rubber goods seem to be flowing in what may be called natural channels—through the druggist, the stationer, the shoe-dealer, the hardwareman, and so on—each getting a share of the trade which is best suited to his particular customers. It is possible for many of the rubber stores in distant localities to retain the trade they have secured, but times are changing and it can only be done by charging small profits, and above all giving good qualities; or, when the customers insist on cheap goods, to graciously tell the truth and forestall the

probable disappointment. Such dealers may be able to control a trade now growing, which will possibly one day be of a volume that will put him in line with some enterprising manufacturer who would work with him to mutual advantage, and not oppose him with a competition which means ruin to the under dog in the fight.

Rubber Tennis Soles by the Thousand.

“NOVELTY” is the word,” says Mr. G. N. Spinney, of Spinney, Virtue & Co., of Lynn, Mass. “I think I can say truthfully that we are turning out more tennis soles than any other concern. Every season new designs are demanded and the popular appetite for novelty and variety must be appeased. The designs for bicycle and tennis soles this year are not only unique, but they are developed with intelligent regard for service. The capacity of our factory is more than three thousand soles per day and 80,000 counters per week. In addition to our own lines of corrugated soles for bicycle, tennis and yachting shoes, we have a large output for manufacturers of shoes who supply us with their own designs and molds. The demand for rubber specialties is increasing. We are getting out every week, between five and ten thousand bottle-washers for one firm. Rubbers for beating out molding machines, wringer rolls and rolls for staking machines, springs for horse-cars—in fact, everything in rubber except rubber babies is in demand.”

Colorado Ladies Wear Rubber Boots.

THE wearing of rubber boots by ladies in Pueblo, Col., is referred to as a new and sensible practice by the *Star*, of that city, in the following style:

“The sensible practice of ladies wearing rubber boots during muddy weather was adopted by quite a number whose business called them on the street in the past few days. There is no more reason why a woman should not protect herself from cold by this means as well as a man. It appeals to reason and no doubt many would gladly adopt the custom if only society leaders would set the fashion. In Denver the mud and slush is so deep in this kind of weather that some such protection is absolutely necessary to render locomotion possible. It is a common occurrence for a lady to raise her skirts a few inches and boldly wade through a sea of mud safely protected both from the damp and the gaze of the leering crowd who stand on the muddiest corners for the express purpose of getting a glimpse at daintily-turned ankles as the blushing ladies struggle across, without any proffer of assistance being made.”

THE revolt of the State of Matto Grosso in Brazil can have but little influence in the rubber trade. While the rubber produced there is as good as that of Pará, and considered by some to be better, it has been gathered in such limited quantities that it cuts little figure in commerce. A few cases find their way into the London market from time to time, “Virgin Slab” being the standard grade, and selling at about two pence below fine Pará.

RECENT RUBBER PATENTS.

AMONG recent patents issued by the United States Patent-Office, embodying applications of India-rubber or Gutta-percha, to a greater or less extent, have been the following. It is not practicable here to do more than to note the use of rubber in each case, with sufficient detail to enable those who are interested to decide whether or not to look into any particular patent more fully:

No. 464,335.—Shut-off Nozzle. Fred. W. Scott, Concord, N. H.

In a shut-off hose-nozzle, a circular enlargement formed at its tip and eccentric therewith, a rotary disk fitting therein and having various openings equidistant from its center, which may be brought in line with the discharge-orifice of said nozzle, a cap-piece having an opening opposite the discharge-orifice of said nozzle, and suitable means for turning said disk.

No. 464,336.—Paint. Wells H. Shearer, Arkansas City, Kan.

The waterproof paint consisting of coal tar, pitch, common mineral paint, hydraulic cement, gray ocher, asbestos, air-slacked lime, salt, liquid drier, and litharge, in substantially the proportions stated.

No. 464,338.—Hose-Clamp. John H. Crisp, Trenton, N. J.

As an improved article of manufacture, a hose-clamp, comprising two semicircular sections hinged together, one section being adapted to be passed through the other section and bent back upon itself.

No. 464,356.—Artificial Limb. Alexander Gault, Medford, Minn.

The herein-described process of constructing the socket-sections of artificial limbs, which consists in wrapping around a cast alternate layers of unvulcanized rubber and aluminum or thin brass, then vulcanizing the rubber upon the cast, and finally increasing the shell thus obtained in a yielding envelope.

No. 464,367.—Insulating Composition. Smith W. Kimble, Denver, Col., assignor to the Mica Asbestite Insulating Co., same place.

The composition described, consisting, essentially, of pulverized mica, silicate of soda, and a mineral substance, such as talc free from lime, combined and molded under pressure, as set forth.

No. 464,369.—Composition of Matter for Insulating Purposes, etc. Smith W. Kimble, Denver, Col., assignor to the Mica Asbestite Insulating Co., same place.

The herein-described hard, dense, and refractory composition of matter having the property of resistance to heat and electricity and of being molded under high pressure without heat, said composition being composed of pulverized mica, silicate of soda, sulphur or sulphur compound, and another mineral substance, such as finely-divided asbestos.

No. 464,386.—Hose-Coupling. William D. Patterson, Keokuk, Iowa.

A coupling formed of two parts, one part being furnished with the spring-pressed latches, the spring-pressed ring and links, the other parts being ground circumferentially and adapted to receive the spring-pressed latches.

No. 464,767.—Vehicle-Wheel. Charles E. W. Woodward, Chicopee Falls, Mass., assignor to the Overman Wheel Co., same place.

The combination, with a wheel-rim having each of its sides deeply grooved to form outwardly inclined seats, of an arch-shaped tire having the basis of its side walls turned inwardly and pointed to fit into the said grooves, its outer edges being attached to the rim at lower points thereon than its inner edges.

No. 464,852.—Cotton-Picker Finger. Ole Cannteson, Waco, Tex.

A cotton-picking spindle made from an elastic material hav-

ing a metallic stiffening-core at one end and with bristles or teeth in an inclined position with respect to the axis thereof.

No. 464,993.—Hose-Coupling. Ransom Reid and James P. Browne, Santa Ana, Cal.

A hose-coupling comprising two members, of which the male member is formed with an exterior annular bevel adapted to engage the correspondingly-shaped opening in the female member, hooks mounted to slide on the female member and adapted to engage the back of the said bevel to draw the said male member to its seat, lugs arranged on each of the said hooks, a lever pivoted on the said female member and having eccentric ends extending between the lugs of the said hooks, and a bridge held on the said female member and through which passes the said hook, the said bridge being provided with a bevel engaged by a corresponding bevel on the hooks.

No. 464,995.—Dressing for Carriage-Tops. William H. Tourrein, San Jose, Cal.

The herein-described carriage-top dressing, consisting of asphaltum, turpentine, neats'-foot oil, Japan drier, oil of cedar, and drip black.

No. 464,932.—Dental Vulcanizer. Thomas J. Carrick, Baltimore, Md., assignor to Snowden & Cowman, same place.

A vulcanizing vessel having a shoulder on its exterior, a lid, two semicircular clamps connected at one side by a hinge and compressing an upper portion which takes over the lid, a rim to surround the joint between the lid and vessel and provided with an inward flange which engages the said exterior shoulder, and means attached to the said upper portion of the semicircular clamps to force down the lid.

No. 464,969.—Inhaler. Almon K. Ives, Chicago, Ill.

A device for applying medicated powdered substances to the nasal, throat, or lung cavities, consisting of an elastic bulb, a discharge-pipe extending through the neck thereof, a cap fitting over the outer end of the discharge-pipe, porous material contained in such cap, having the passage-way extending through it, forming a continuation of the passage-way through the discharge-pipe, liquid and volatilizable material contained in the porous material, and a perforated cap fitted over the cap containing the porous material, whereby when the porous material has contained therein such liquified matter, and the bulb has therein finely-powdered material, such finely-powdered material can be expelled from the bulb by compression thereof, and the mixed current of air and finely-powdered material will be medicated as it extends through the passage-way therefor from the bulb.

No. 465,076.—Method of Forming Dental Plates. Malcomb R. Griswold, Hartford, Conn.

The method of manufacturing a false-tooth plate of India-rubber, that consists in first packing into a groove in the lower section of a dental flask made in at least three sections India-rubber of the required color for representing the gum, then placing the middle section of the mold containing the teeth over the lower section, then packing into the flask containing the mold the rubber that forms the main portion of the tooth-plate, then placing the upper section upon the middle section and clamping the several parts securely together, and then vulcanizing the plate in the usual manner.

No. 465,189.—Overshoe Attachment. Joseph H. Morrison, Centerville, Kan.

A clamping attachment for rubber or other like overshoes, consisting substantially of a pair of opposite lateral pivoted clamps on wings having their free ends outermost and of a cam-

lever for manipulating said pivoted or hinged wings, the whole adapted to be applied to the upper heel-end portion of an over-shoe.

No. 465,365.—Rubber-Dam Clamp. Flouair E. Hassen, Minneapolis, Minn.

The holder herein described, consisting of a wire to grasp the ear of the patient, and a catch at the end of the wire, an adjustable check-piece on the stem of the wire, and a hinged and sliding batch on the wire to engage the catch.

No. 465,484.—Powder-Blower. Anthony E. Magoris, Binghamton, N. Y.

In a powder-blower, a rubber bulb or bellows provided with an outlet-orifice, in combination with a porous sack or powder-

receptacle located within the bulb and having its mouth placed over said orifice, said sack being composed of non-soluble material.

No. 465,584.—Conduit for Electric Wires. Henry W. Johns, New York, N. Y.

A conduit for electric wires, composed of strips of compacted asbestos fiber wound in opposite directions, and waterproofing material and cementing material.

No. 465,701.—Pipe-covering. Charles E. Manville, Milwaukee, Wis.

A composition of matter for pipe and boiler covering, consisting of graphite, clay, and wool-shoddy-dust, with glue or dextrine.

Notes on African Rubber Plants.

SOME notes and hints on the vegetable products of tropical Africa are contributed to recent numbers of the *Journal of the Society of Arts* (London) by John P. Jackson, including mention as below of rubber-producing plants:

"The various kinds of African rubber at present known to commerce are furnished by climbing-plants belonging to two natural orders, namely, Apocynaceæ and Urticaceæ; the bulk of them, however, are from the first-named order, and from plants belonging to the genus *Landolphia*, of which the following species have been described:—1. *Landolphia owariensis*, extending from Sierra Leone, Angola, the Niger, and the mouth of the Congo, where it is known as the 'Mvoochi'; it is the 'Abo' of the Niger. 2. *L. florida*, widely distributed over the whole of central tropical Africa, yields a portion of the rubber both from the east and west coasts; native name, 'Mbungu.' The globular acid fruits are edible, and are known as 'Aboli.' 3. *L. Kirkii*, an East African species found on the Zanzibar coast. 4. *L. Petersiana*, also a native of the east coast."

Under the head of "Liberian Rubber," referring to the *Ficus*, or *Urostigma Vogelii*, Mr. Jackson writes:

"The trees yielding this rubber are known in West Africa by the name of 'Abba.' The rubber has been valued in the London market at 1s. 6d. per pound, but would realize higher prices if sent home in a cleaner state than it hitherto has been. The District Commissioner at Badagry, writing in 1888, says: 'From the trees already in full growth in the bush and towns a considerable export trade could be rapidly established, and systematic planting would develop the trade to almost an unlimited extent.'"

[In a later issue of the *Journal* Mr. Jackson states that upon the receipt of new information he regards the prospects of this particular kind of rubber becoming a commercial article as very slight.]

"Any plants belonging to the orders Apocynaceæ, Euphorbiaceæ, or Urticaceæ, may be examined for the presence of rubber, for it is from plants of these three orders that all the rubber of commerce is obtained. The finest Pará rubber is furnished by an euphorbiaceous tree, *Hevea brasiliensis*, and the Assam and Central American rubbers from urticaceous plants, *Ficus elastica* and *Castillio elastica* respectively."

"True Gutta-percha is obtained from *Dichopsis gutta*, a sapotaceous tree of Singapore, Penang, Borneo, etc.; the nearest approach to it as an African product is gutta-shea, obtained from the 'Shea,' 'Galam,' or 'Bambouk' butter-tree (*Butyrospermum Parkii*), a tree thirty or forty feet high. Shea butter is the solid fat contained in the seeds. It is useful for making hard soaps. Gutta-shea is separated from the fat in the course of soap-making, and is found to be present to the extent of from .5 to .75 per cent. Though somewhat similar to Gutta-percha,

it has not yet come into use. A kind of Gutta-percha is also obtained from the trunk of the tree in small quantities.

"The milky juice of several species of *Euphorbia* solidify on exposure to the air. Some interest has of late years been attached to these juices for the purpose of mixing with rubber and Gutta-percha, as well as for the manufacture of an anti-corrosive paint for ships' bottoms. The gum has been brought into England from St. Paul de Loanda and from Natal. Attention should be given to the juices of any species of *Euphorbia*."

A Rubber Cushion in Water-Wheel Buckets.

AN improvement in turbine wheels consists in the application of a rubber cushion to the buckets, in such a form as to prevent the dispersion of jet into spray, which occurs to a greater or less extent upon striking a metallic surface. The motors are flattened sides, and the inlet pipe is forked to deliver near the center on both sides of the motor. This delivery is into two chambers, or reservoirs, on either side of the central arms carrying the bucket rings and imparting motion to the shaft. Each reservoir is provided with four jet heads, and each head with three jet holes one-sixteenth inch in diameter, lined with bronze, making twenty-four delivery jets in each motor; these streams delivered at an angle of 45 degrees, strike upon the buckets contained in a cold-rolled copper bucket ring, and each ring contains 120 buckets. The reservoirs are bolted to the frame, with lead gaskets between, and by the construction of the bucket rings an excess of weight and all liability to rust are avoided. As compared with ordinary wheels, those with the rubber covering show a difference of 30 per cent. superiority. The rubber as thus applied of course does not cover all the bucket, as the discharge lip is left free.

Aluminum Boot-Trees and Lasts.

IT is conceded that the wooden last and tree as used by rubber-manufacturers is eventually to be replaced by metal. For some time thought has been turned to iron as the desirable thing and some factories have adopted them. Now that aluminum has entered the field, however, it looks as if that would be the winner. Tests are now being made on aluminum trees in one large factory which are said to be very satisfactory. The first cost of this metal is of course quite a feature, but the bill that comes to the manufacturer for repairs on wooden lasts, for changes necessitated by shrinkage, and for new lasts to replace those burned up, is no small offset to this. Then, too, there is the fact that a size made on an aluminum last will always remain that size, and there is a saving of about 25 per cent. in time of vulcanization. In boots when styles change the foot can be detached and another fitted to the old leg, while the metal can be melted up and used over and over again.

ELECTRICITY IN THE HARDWARE STORE.

By Herbert Laws Webb.

ELECTRICITY has long ago broken down the resistance which public prejudice opposes to all new-fangled ideas and innovations the true source of which is not readily and easily understood by the multitude. True, electricity yet has its mysteries for the multitude, as well as for those who generate and control it day by day and night by night. But it has become an accepted agent in our daily life; it does every-day work in an every-day manner, and although it yet has many charms which endear it to the lively imagination of the newspaper reporter, it is regarded by the multitude as among the established order of things—whether it tinkles a bell or tonches off a murderer it no longer arouses feelings of awe and mystery.

Yet it is indisputable that many people have not yet learned to put very much faith in electricity when it is brought right home to them. They see electric-lights sparkling and shining all around them, they see electric motors driving street-cars and performing hosts of minor duties; they see the telegraph clicking and the telephone bell vibrating, and yet they persist in thinking that the internal organization of all these things is always going wrong and that numbers of learned men are constantly working themselves to death to set it right and keep it going right. They have, or have had, electric bells in their houses, and they generally find that the bells after a time get out of order at some critical moment and that after that there is always "something wrong."

The hardwareman has a distinct connection with electricity, which in future will become of great importance to both industries, and in order to take advantage of it intelligently he certainly should take care to ground himself in the subject so that he shall know what he is talking about when he is trying to sell electrical goods. Of course the amount of study or reading required to do this is really very slight. It is very easy to find out the principle of the ordinary galvanic battery, the operation of the electric bell and its accessories, the methods of connecting up circuits and the merits of different kinds of insulated wire. There are several popular books on electricity which give all this information—and more—in a simple, straightforward manner. The careful perusal of one of these books will rob electrical apparatus of most of the mystery which appears to surround it to those who have never taken the trouble to investigate properly.

Electrical apparatus of the lighter sort undoubtedly should form part of the stock of every well-equipped hardware store that is at all distant from electrical centers where the regular supply-houses abound. Household electrical appliances would be far more freely used were they more easily obtainable. The average householder very seldom strays into an electrical supply-house, but he is far more likely to visit the hardware store. If he sees there an attractive display of household electrical-appliances,

the operation of which is explained to him by the proprietor, he is likely to buy.

The various services which electricity can perform in the household to-day are almost innumerable. Where the electric-light is used, lamps of course often need to be replaced. Such work at present is done by the electric-light companies, but before very long incandescent lamps will be included in the hardwareman's stock as naturally as oil-lamps and gas-fixtures are to-day. Telephones at present are supplied only by the American Bell Telephone Co., but even Bell patents do not go on forever, and when the telephone is on the free list many people who now do without it will need its services, and the hardwareman who is up with the times will keep telephones in stock. To enumerate the various devices which have grown up about the electric bell would require a page or two of this journal, but they all ought to be obtainable at the hardware store. Besides these things there are other electrical appliances, useful, novel and amusing, with nothing mysterious or awkward to handle about them, which the hardwareman who moves with the times should include among his stock. There are small motors, run by battery power, for operating sewing-machines and fans; electric gas-lighting devices; electric cigar-lighters, complete in themselves; electric toys of various kinds, and a host of other things which are described in the catalogues and circulars of the various manufacturing and supply companies.

For the hardware-dealer to be successful with electrical goods he needs to pay attention to a few practical points. He should acquire some knowledge of the subject himself, sufficient to understand the general principles and to enable him to master the operation of any appliance he has on sale and to explain it clearly to his customers. This will often help him to make a sale when silence or a confession of ignorance would have exactly the opposite effect. If possible he should have an assistant who is able to do small jobs in the way of installing, repairing and looking after the goods that he sells. The "looking after" is the most important part, as a very slight amount of care and attention when once things are set up will generally postpone the necessity for repairs indefinitely. That leads to another point: Avoid cheap goods. Cheapness in electrical apparatus—as in most other things—is synonymous with untrustworthiness, and there is no defect more fatal in anything electrical than that it should be untrustworthy. Buy and sell only good material and substantial, well-made apparatus, and you will save yourself much trouble with your customers. Cheap goods and cheap work have done a great deal to damage the reputation of electricity as an efficient public servant. The electric current requires careful treatment to enable it to do its best work, and if the paths for it are not made easy it will often refuse to stir, or else waste its energies in the wrong direction.

Another important point is to display the goods well.

Keep them in good condition and in a prominent position. If possible have a few of the more attractive and obviously useful articles arranged so that they can be readily shown in operation. Take care that everything about the store that can be done by electricity *be* done by electricity, to show that you believe in electricity yourself. Draw the attention of your customers to the uses to which electricity can be put by means of illustrated circulars and placards which can be obtained from the electrical supply companies. It is a good plan, too, to place a few of the popular books on

electricity in your show-cases. Many a chance customer may be attracted by showing him that the mysteries of the working of ordinary every-day electrical apparatus are easily mastered. Before very long electrical apparatus of all sorts, except heavy machinery and devices having special applications, will form a part of the stock of the progressive hardware-dealer, and if the p. h. d. will take the trouble to familiarize himself a little with the subject he will find that he has overlooked an important and lucrative branch of the trade which naturally belongs to him.

The Decay of India-Rubber.

MR. W. THOMPSON says, in a paper on the vulcanization and decay of India-rubber, that copper salts have an injurious effect on India-rubber, and as that metal is sometimes used in dyeing blacks and other colors, cloth so dyed is liable to decompose and harden the rubber put into it. Metallic copper placed in contact with thin sheets of India-rubber brings about oxidation and hardening of its substance, although no appreciable quantity of copper enters the India-rubber; but metallic zinc and silver have no injurious effect on the rubber. The author had found that if oil containing a certain amount of copper, which it often does, gets on the cloth, the action of the bleaching agents on the copper damages the cloth. There is an acid in ordinary linseed oil that rots cloth. The smell of India-rubber is one of the characteristics of its decomposition. When a piece of blotting paper is placed over decaying rubber it becomes colored by some of the emanations, as does not occur with good rubber. There is therefore no doubt that certain volatile substances are emitted during the oxidation that produces the hardening of India-rubber. Rubber can be kept best under water or glycerine, or in coal-gas. It remained good when placed in a vacuum and exposed to sunlight for twelve months. All oils, except castor oil, have a detrimental effect on India-rubber.

An Arrow that is Feathered with Rubber.

OF late years whales have been hunted in far different fashion from what they were in the olden time. The harpoon of the present is in reality a huge arrow ending in a shank into which two barbs fold; these spring out and hold fast in the animal's flesh when a strain comes on the line. The harpoon is fired from a cannon mounted on a swivel carried in the bow of the steamer. The head of the harpoon carries an explosive shell, which is fired by the breaking of a glass tube filled with sulphuric acid, and the tube is broken the moment the animal strains the line attached to the harpoon in its dash to escape after being struck. The rear end of the harpoon has on it feathers made from a fine black rubber that hold it straight to its course, as it flies through the air. The line attached consists of a length of chain next the harpoon, and then a stout cable, and the two are connected by an accumulator spring which takes and breaks the first strain of the animal's dash. Usually the explosion of the shell fails to strike a vital spot, and in that case the whale is apt to show fight. The steamers employed are vessels built of iron, about sixty to one hundred tons register, with engines of twenty-five to fifty horse-power, nominal. Such a vessel, with sails backed and engines working full speed astern, and with a long length of cable dragging through the

water, presents a very powerful obstruction, but yet monster whales often prove strong enough to move the steamer with considerable speed.

Accidents in Rubber-Mills.

THE grinding- and calendering-rooms in rubber-mills have ever been places where accidents occur. When the heavy rolls of washer, mixer or calender are full of a sticky, pasty mass of gum and are in constant motion it is very easy for the workman, grown careless by familiarity with danger, to put his hand too near the greedy machine and to get caught. He is very lucky if he tears himself loose with only a mutilated member. It has happened that arms have been torn out, and even lives sacrificed, before help could possibly arrive. This is in part because a machine at work cannot be stopped without stopping the engine, which consumes valuable time. In a few instances a foreman with remarkable presence of mind has thrown an iron bar into the driving gears and by breaking the teeth has stopped a grinder and saved a life, but it has also happened that in the presence of so frightful an accident men have become dazed with fright and have stood helplessly by until it was too late to render effective assistance.

In one or two of the best-equipped rubber-mills this danger is guarded against by friction clutches, but in most of them there is no such provision. All agree that as a measure of economy if not of humanity such devices should be used. In the last five years considerable money has been expended in repairing broken machines, and in settling claims of injured workmen that might just as well have been saved. Manufacturers claim that the right clutch has not been offered and that is why they are not equipped. In the advertising columns of this paper is shown this month a cut of a clutch that has already received the endorsement of the best rubber superintendents, and will no doubt soon be generally adopted. It is manufactured by Moncrief, McClay & Co., of Pawtucket, R. I., who will gladly answer all communications concerning it.

It is Very Injurious.

TO THE EDITOR OF THE INDIA RUBBER WORLD: Please inform me if vulcanizing rubber by the cold process is injurious to the health of persons who work with the solution, and what is the effect produced when there is no protection from inhaling the vapor. Yours respectfully. O. C. PIKE.

Akron, Ohio, March 17, 1892.

DOING business without advertising is like winking in the dark. You know what you are doing but nobody else does.

POINTS ON THE MANUFACTURE OF RUBBER FOOTWEAR.

THE various process of rubber manufacture have been described so often that it seems as if the whole world must know all about it. Yet day after there comes up the old story of melting rubber and pouring it into a mold and thus forming the goods. As a matter of fact, rubber

when melted becomes a sticky tar-like mass that is unfit for use in rubber goods and can never be made any better. To use an old simile and one that to rubber-men will be "chestnutty" the rubber business and the bread business are very similar. Crude rubber is first washed, by passing it again and again through corrugated rollers that run together under a constant stream of water. The machine that does this cleansing is known as the washer. After drying for weeks or months the gum is then massed or ground together until it is smooth and homogeneous, and then it is put on what is known as a mixer.

This is merely a heavy pair of steam-heated rolls, running close together with a friction motion. The heat of the rolls gives the rubber a doughy form and the friction motion mixes the various ingredients into the rubber. The result is not a liquid—it is a dough, pure and simple. The rolling-pins for running this out into thin sheets are called calenders and are huge steam-heated rolls, three, four, and sometimes five and six in a stack, through which the rubber dough is spread upon canvas aprons. These sheets, after cooling, are cut up into various forms and the parts pasted together with rubber cement. When the making up is finished the goods are put in huge ovens and baked, and there is no melting process about it.

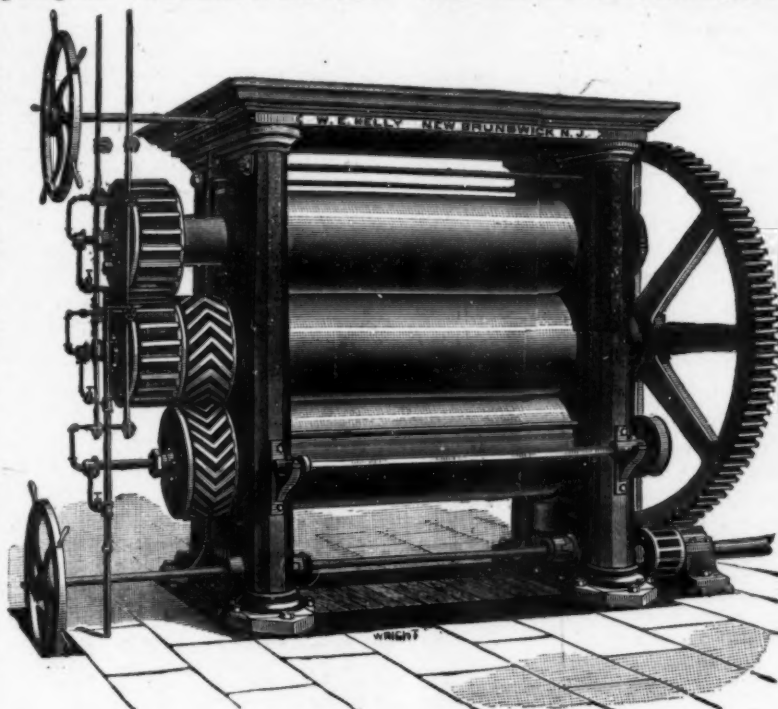
In making boots and shoes the upper sheets that are to be ornamented are run through

engraved calenders, the soles go through small soling calenders and receive their corrugations also from engraved rolls. The finish around the edge of a shoe that looks as if it were made by a sewing-machine needle is really made by a sharp tracing wheel in the hands of the shoe-maker before baking. The general belief that an ordinary rubber shoe is chiefly cloth and varnish is wholly wrong, while the fallacy that unvarnished boots were pure gum and others shoddy was ridiculous. As a matter of fact the varnish that is put on a rubber shoe or boot is simply a very light coat of boiled linseed oil. Its office is to make a handsome finish and the rubber and the fabric are relied upon for the wear. To-day there are better rubber shoes made than have ever before been produced. Manufacturers have experimented for years and spent thousands of dollars to find out just what ingredients

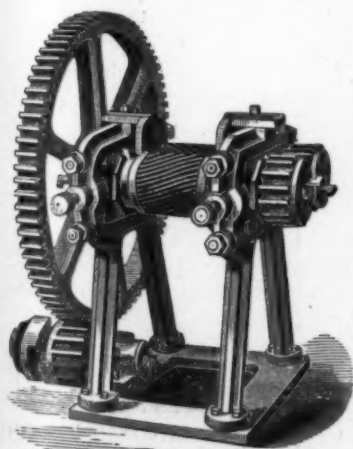
entering into rubber helped its life and its wear, and the growling that one hears comes from the ignorant and unappreciative.

The Tennis-Shoe in England.

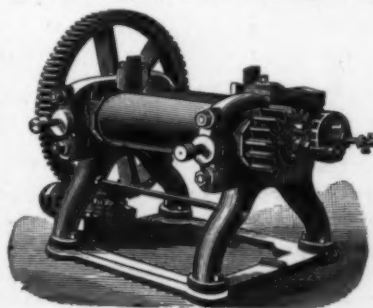
THE tennis-shoe, which first originated in England, is known there as the "Plimsoll." A New England rubber-shoe company had an order for 1,000,000 pairs offered it lately. The buyers wanted low-priced goods, though—say a women's shoe for 18 cents per pair. Our manufacturers think that when they get up a shoe for 30 cents they are cutting things about as fine as they can, but it seems that the English trade can give them points on tennis-shoes as on woollens and some other things. Yet there are some good souls who never associate the term "shoddy," with anything English. And yet brummagem represents a type of goods and character that are nowhere else so common on the face of the earth.



THREE-ROLL CALENDER.



RUBBER-WASHER.



RUBBER-MIXER.

THE "TIRE AGE" IN BICYCLES.

THE catalogues of the bicycle-manufacturers are out in full force for the season of 1892, forming a class of trade literature that has suddenly become of interest to rubber-men, for the reason that every properly-constructed bicycle nowadays must be provided with a rubber tire. The amount of rubber consumed in the manufacture of wheels already forms a factor of importance in the market for crude gum, and the demand promises to be not only permanent but a steadily-growing one. The bicycle interest so far seems not to have appealed to the interest of rubber-manufacturers generally, as has been the case recently in England, where many factories are advertising tires as an important specialty. In this country, so far, an important part of the rubber bicycle-supplies have been furnished by a single concern, devoted to this branch of manufacture alone.

There are exceptions, of course, among rubber-manufacturing firms, in this respect, including the New York Belting and Packing Co., Limited, who have issued lately a copyrighted pamphlet entitled "Rubber Bicycle Tires," indicating that their trade in these goods has become so extensive and embraces such a variety of styles, as to call for a separate catalogue. They assert that they are the only rubber-manufacturing firm in this country, so far, to engage in the manufacture of bicycle tires. To quote from their catalogue:

"The use of bicycle tires is now an established fact, and promises to be permanent. The only question which arises is what style of tire to use? Shall it be solid, cushion, inflated, cushion (Boothroyd), or regular pneumatic, having an inner tube and an outer protection cover; and for the selection of users, we offer all the different kinds. We manufacture several grades of solid and cushion tires in all the leading sizes. Some are made of pure fine Para rubber, without any compounds, and others with compounds, all of which we guarantee."

Experience has taught them that a compounded tire often gives better results than a pure rubber tire. The point wherein they claim superiority is in the compounding of rubber by a new and secret process. This catalogue embraces Pneumatic, Cushion and Solid tires, which are furnished in sizes, weight and quality to suit customers, by which are meant manufacturers of bicycles. Cushion tires are quoted at prices ranging from 90 cents to \$1.50 per pound.

The fifth annual catalogue of Hulbert Brothers & Co. (No. 20 West Twenty-third street, New York) contains a chapter on the "Tire Age," as the improvement of the tire is the point to which manufacturers and inventors of bicycles are now directing their energies. We quote:

"We have already passed through several ages of the bicycle, and we are now upon the most important period of bicycle history. The tire question of to-day, however, is a much clearer and better defined one than that of last season at this time, having taken more definite form, and, owing to test and actual experience, we are now prepared to talk more intelligently than before. There is, however, some diversity of opinion regarding the exact kind of tire to be used; this diversity of opinion refers more especially to pneumatic tires than to other styles, and in the selection most excellent judgment must be exercised. There

is some hesitation on the part of a few as to the merits of the cushion tire, and they advocate large solid tires instead. Our experience has been that a good cushion tire is practical and durable, and we shall advocate its use. There are many pneumatic tires on the market to-day which are largely advertised not to puncture; these, strange as it may seem, we have steered clear of, as we have found that a tire which is impossible to puncture has also lost at the same time its buoyancy and life, and become little more than a good cushion tire. The advantage of a pneumatic tire lies in its rebounding qualities and its great buoyancy; from these two elements it derives its great speed and easy-running qualities. We therefore have adopted the genuine pneumatic, with all its advantages, coupled with some recent inventions for its ready repair in case of puncture or injury to the wheel itself. This readiness of repair is due to the detachability of these tires, and the mode of doing so does not add to, but lessens its complication."

The "Liberty" wheel, manufactured by Wilson, Myers & Co., Lessees (No. 55 Liberty street, New York), is fitted with cushion or pneumatic tires, as desired. The preference of the manufacturers, however, is for a special form of the pneumatic tire. They say in their new catalogue:

"The correctness of the pneumatic-tire theory is no longer controvertible and the particular tire we have adopted has been selected as the one giving the best satisfaction thus far. It is 'light, resilient, and strong,' will not burst nor puncture, but can be released at any time and reinflated with ease. The simplicity and perfection of the valve largely contribute to this desirable feature."

In the construction of a true pneumatic tire, according to the Gormully & Jeffrey Manufacturing Co. (Chicago and New York), there are "certain inviolable principles" which must be followed, to wit:

It must be flexible and yielding.

To be speedy, it must be resilient.

The tire must be compact and light.

It must be simple and capable of easy and rapid repair.

It must be attached to the rim in a simple and effective manner.

It will be so constructed as to minimize the liability to dangerous side slips.

The sides must be thin and flexible, even the tread portion must be rather thin than otherwise.

It must sit in a flat or nearly flat rim, so that the whole tire will be available for cushioning purposes.

Speaking of the bicycle trade of 1891, which surpassed in extent all predictions, the Sweeting Cycle Co. (Philadelphia) say in their latest catalogue: "The year has not been without its surprises. Foremost among them comes the pneumatic tire. At the beginning of the year it looked as if the whole business would be in single hands, but the utter worthlessness of the first tires put on the market brought American brains into play, and now the manufacturer who does not have his own pneumatic tire is in the minority."

Among the advocates of the cushion tire are the Smith Wheel Manufacturing Co. (Washington, D. C.), who say in their catalogue:

"We have adopted cushion tires because we believe they are an improvement and render cycling more enjoyable, and (by removing all vibration) beneficial to the rider."

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